

THE EFFECTS OF VOCAL RATE AND SYNCHRONIZATION
OF COVERBAL CUES ON INFORMATION PROCESSING
AND COMMUNICATION OUTCOMES OF COMPREHENSION
AND PERSUASION

By

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by

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DEDICATION

Trees
deep dark brown roots
intertwining
high green canopies
reaching
for the sun.
Changing together through seasons
mutually interdependent
a slow, graceful dance in the wind.

For Patricia, without whom this would not have
been done, without whom the tree would still be
a struggling seedling.

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The present research investigated the effects of vocal rate and the synchronization of coverbal cues on receiver distraction, message comprehension, receiver counterarguing, and receiver yielding to a counterattitudinal message. The rationale of the study was developed from an information processing perspective, and based on that rationale, a synchronization main effect was predicted for message comprehension, while vocal rate by synchronization interaction effects were predicted for distraction, counterarguing, and receiver yielding. Additionally, predictions were made concerning comparisons between messages which contained synchronized coverbal cues and messages which did not (either cues were not performed or messages were delivered on the audio channel only), and how such messages might differentially affect comprehension and persuasion. It was predicted that messages which contained coverbal cues would be more effective in terms of comprehension and persuasion than messages which did not contain these cues.

Two acting students were videotaped while delivering a persuasive counterattitudinal message. The message was delivered in a synchronized manner, where coverbal cues (hand gestures, body movements, facial-head

activity) were well synchronized to the vocal rhythm, or in an unsynchronized manner, where coverbal cues were not synchronized to the vocal rhythm, or the message was delivered with the speakers not performing coverbal cues at all. Thus, synchronization was manipulated on three levels. The messages were also delivered at either a normal or fast rate of speed. Subjects were exposed to either a videotaped version of the different encoding conditions in which synchronization and vocal rate were manipulated, or to an audiotaped version of the message in which only vocal rate was manipulated. Additionally, some subjects were randomly assigned to a no-message control group. Subsequent to message exposure, all experimental subjects responded on recall and recognition measures of comprehension, a series of scales measuring distraction, scales measuring position on the attitudinal topic, a free response counterarguing measure, and a series of scales measuring the source's credibility. The credibility measure was included as a manipulation check on subjects' impression of the source across different encoding conditions.

The data were analyzed by a 3×2 analysis of variance for unequal N with a two level speaker blocking effect included, and by planned comparison t tests. Results indicated support for the synchronization main effect prediction on comprehension such that synchronized messages were significantly more comprehensible than unsynchronized messages. The results failed to indicate support for the interaction predictions for distraction, counterarguing and attitude yielding, or for the comprehension and yielding predictions for the comparisons between synchronized messages and messages which did not contain synchronized cues. The results were discussed in terms of the low power found for the predicted effects in the analysis, how the rationale might be expanded to live

face-to-face interactions, and the implications for an information processing perspective of nonverbal effects on communication outcomes.

CHAPTER I

INTRODUCTION

Statement of the Problem

The complex nature of human behavior is a continuing problem for theorists and researchers in the social sciences. Both theories and research methodologies are continually adjusted in an attempt to explain and predict human behavior. Those in the field of human communication are concerned with the complexity of communicative behavior. Such a concern has led communication scholars to conceptualize communication as a multi-level, ongoing process involving the transmission of messages on nonverbal as well as verbal levels. The relationships between verbal and nonverbal message elements, the effects such relationships have on encoding, decoding and the processing of information, and the organization of such messages over time are all problems to be dealt with.

Information processing theories have afforded communication theorists and researchers a useful conceptual framework and have the potential to be theories of high explanatory and predictive power for communication processes. Much of information processing research has focused on how individuals process information internally. This research has primarily concentrated on identifying internal factors such as cognitive complexity, emotional states, and manner in which information is integrated, all of which are seen to affect the processing of information by humans.

Relatively less attention has been paid to external factors that might affect the manner in which humans process information internally.

It is important for communication theorists and researchers to identify aspects of the communication process such as source and message factors that will affect the cognitive processing of information by individuals. Further, two important goals of communication, accurate exchange of information and persuasion, are mediated by the processing of information. The comprehension of a message, as well as its persuasive impact will certainly be affected by factors which affect the processing of information. The specification of relationships between source and message factors, information processing, and the communication outcomes of comprehension and persuasion is a central concern of the present work.

Several explanations for the effects of messages on comprehension and persuasion have been offered. One alternative explanation involves the amount of effort expended in receiving and processing messages. For comprehension of messages this line of reasoning suggests that difficulty encountered in message reception requires receivers to expend extra effort to receive and process such messages. Reception difficulty would be caused by some form of distraction co-occurring with the message. Since difficult messages require more effort to receive and process, receivers pay more attention to such messages and consequently comprehend them better. However, empirical support for an effort explanation of message comprehension has not been great (Eagly, 1974).

An effort explanation of message effects on persuasion offered by Baron, Baron and Miller (1973) argues that the increased effort required to comprehend and process counterattitudinal messages results in dissonance arousal. In order to justify the expenditure of effort and reduce dissonance, receivers should therefore yield to the message. Although the effort-justification explanation has received support for

counterattitudinal advocacy situations (Zimbardo & Ebbesen, 1970), empirical support for this explanation in message reception situations has not been compelling (Eagly, 1974; Insko, 1967).

Another alternative explanation for message effects on comprehension and persuasion argues that a receiver's impressions of the source and affective reactions to a message are the primary factors which influence comprehension and persuasion. According to this explanation, making reception conditions more pleasant for receivers should increase comprehension of the message. Further, bolstering a source's credibility, appearance of confidence, status, and attractiveness should result in a receiver's yielding to counterattitudinal messages. Although some empirical evidence supports the positive affect and source impression bolstering explanation (Miller, Maruyama, Beaber, & Valone, 1976), it is not clear that such factors are the primary ones which affect message comprehension and persuasion.

A more complete explanation of message effects on comprehension and persuasion might be offered by an information processing point of view. While the effort and impression bolstering explanations are alternatives, these explanations do not consider factors and relationships that an information processing explanation might consider. Cognitive responses to message reception such as counterarguing, cognitive sets and expectancies, and the motivation to process information are examples of factors that are not considered by the effort and impression bolstering alternatives. An information processing explanation which takes into account message and source factors that affect cognitive processing of messages and the outcomes of comprehension and persuasion may provide a more adequate explanation of these processes.

Of the source and message factors which have the potential to affect cognitive processing of information and thus mediate the outcomes of comprehension and persuasion, one set of factors in particular has received little theoretical or empirical attention: nonverbal factors. Although communication researchers have been concerned with how verbal communication might affect information processing and thus mediate outcomes like comprehension and persuasion, little research has systematically considered how nonverbal factors might affect the processing of information and mediate message comprehension and persuasion. Given that there is evidence to suggest that nonverbal factors have a powerful influence on the overall communication process, it seems reasonable that nonverbal factors should affect information processing and the communication outcomes of message comprehension and persuasion.

A number of information processing theories have been cast in chain of responses terms, and thus it is particularly useful to consider which of the information processing stages may be affected by nonverbal factors. Of the attention-comprehension-yielding chain (Hovland, Janis, & Kelly, 1953; McGuire, 1968, 1969), the attention stage may be the one most directly affected by nonverbal factors, although the other two stages certainly should be affected. Since the attention stage is the initial stage in receiver's information processing sequence, it may be particularly sensitive to nonverbal influences associated with a source's message delivery. Interestingly, of the three stages, the attention stage is the one least researched by information processing proponents. Specification of relationships between nonverbal factors and attention processes, as well as message comprehension and yielding, should be worthwhile for communication scholars who take an information processing point of view.

Certain nonverbal cues are more likely to affect the processing of information than others. Existing research and literature indicates that nonverbal cues such as vocal rate, certain forms of hand gesture and body movement, eye contact and facial-head movement and expression are all associated in some way with persuasive intent, message comprehension, or attention (Cohen, 1977; Ekman & Friesen, 1969; Mehrabian & Williams, 1969). Additionally, Markel (1975) has offered a distinction which seems relevant to identifying the pertinent set of cues. He suggested the term coverbal behavior, for "the behavior of interlocutors which occurs in association with or accompanying words, but which is not essential for the articulation or grammatical functioning of words" (p. 189). As a general focus, then, out of all the possible nonverbal cues that might be considered, coverbal cues should have the highest probability of affecting attention, comprehension, and persuasion because such cues co-occur with the verbal stream.

A related point is that there may be a particular attribute or set of attributes which such cues share that are important in determining how these cues operate in a multi-channel system. Although such attributes as duration and intensity might be considered, the dynamic nature of these cues is one attribute of primary concern to the present investigation. Dynamic nature refers to the quality of energy and force in motion. Dynamism may be an important cue attribute because energy and force in movement will likely affect a receiver's attention. It is quite plausible, then, that coverbal cues which are of strong dynamic quality will affect a receiver's attention to a message in systematic ways.

Ekman and Friesen (1969) have distinguished several types of relationships that may exist between a nonverbal act and its significant, one of which is a rhythmic relationship. A rhythmic relationship is one in

which a movement traces the flow of an idea or accents a particular phrase, or describes the rate of an activity. It seems that the qualities of dynamism and rhythmicity are closely related, that both are involved in the coordination of co-occurring verbal and nonverbal parts of messages, and that they both may have an impact on receiver attention, comprehension and yielding. These two qualities may be distinguishing factors for nonverbal cues that have the potential to affect information processing and communication outcomes.

Another factor to consider is the relationship between different non-verbal channels and their relationship to the verbal channel. A number of authors (Argyle, 1969; Kendon, 1975; Weitz, 1974) have argued for an integrated, multi-channel approach to the study of nonverbal communication. Such an approach would consider the nature of nonverbal cues that occur simultaneously, the organization of those cues across time, and begin to assess the complexity of the multiple message system. Recently, researchers have begun to investigate the structure of multi-channel communication and its effects on communication processes and outcomes like affective communication, deception and nonverbal leakage, impression formation, and conversational regulation. However, relationships between multi-channel communication systems and attention, message processing, comprehension and persuasion have not been clearly delineated or assessed. A further goal of the present investigation is to begin to specify important multi-channel factors which will affect the attention to, comprehension of, and agreement with a message.

One trend in information processing research has attempted to specify relationships between information processing stages. Some research (Eagly, 1974; Hovland, Janis, & Kelly, 1953, p. 287) has indicated that increases in the comprehension of a message facilitates acceptance or yielding to the

message. However, other factors have been shown to modify this relationship between message comprehension and persuasion. The extent to which a message is counterattitudinal, the extent to which a receiver counterargues during reception of the message, and the extent to which a receiver is distracted from the content of the message have been shown to mediate the relationship between message comprehension and message acceptance (e.g., Osterhouse & Brock, 1970). Generally, increased comprehension of a counterattitudinal message does not lead to acceptance of the message, but to increased resistance through counterarguing against the message (Eagly, 1974). Distracting receivers during reception of a counterattitudinal message disrupts their ability to counterargue and thus increases message acceptance. Distraction, and the forms it takes, may thus play an important role in determining the relationships between information processing stages. In this context, nonverbal factors may operate to focus receiver attention on the content of the message, or to focus receiver attention on the delivery of the message by providing different levels of distraction within a multi-channel system. A consideration of how nonverbal factors may operate as sources of distraction within multi-channel systems and thus affect a receiver's attention to and comprehension of a message, as well as a receiver's counterarguing with and yielding to a message is of specific interest to the present work.

In summary, the present work argues from an information processing point of view which takes into account message and source factors that affect cognitive processing and the outcomes of comprehension and persuasion. Nonverbal factors, and coverbal dynamic cues in particular, may have great potential to affect a receiver's attention to, comprehension of, and agreement with a message. Additionally, the organization of these cues in a multi-channel system should be an important factor to

consider in specifying these relationships. During reception of counter-attitudinal messages, coverbal dynamic cues and the way in which they are organized may operate to inhibit receiver counterarguing and make receivers more susceptible to influence. These nonverbal factors may inhibit receiver counterarguing by providing different levels of distraction. Coverbal dynamic cues and the manner in which they are organized may distract receivers from the content of the counterattitudinal message and focus their attention on the delivery or coverbal aspects of the message to a greater or lesser extent. Specifically, the present work is concerned with the following relationships: (1) how the coordination of an encoder's coverbal dynamic cues to the encoder's vocal rhythm (or the lack of such coordination) might provide differing levels of distraction and thus affect a decoder's attentiveness, comprehension, counterarguing, and yielding to messages; (2) how vocal rate affects these same processes; and (3) how vocal rate and the coordination of dynamic coverbal cues to vocal rhythm may interact to provide differing levels of distraction and thus affect these processes. The intent of the following review is to support and further delineate these relationships.

Review of the Literature

This review will consider literature from a number of diverse areas in order to support the points made in the introduction. First, literature dealing with nonverbal cues associated with attention, comprehension and persuasion will be reviewed. These sections will provide information about which cues have been associated with these constructs, the nature of these cues, and what other cues may potentially be associated with these constructs.

Second, literature concerned with the organization and coordination of nonverbal cues will be reviewed. Research on behavioral synchrony,

vocal rhythm and linguistic units such as the phonemic clause will be covered in this section. Information about the nature of multi-channel communication and the relationships between channels will be provided here.

Finally, a brief review of distraction and attitude change research as well as research on counterarguing will be presented. This section will contain information dealing with how receivers react to messages, given certain message and reception conditions. Implications for processing of information and the outcomes of comprehension and persuasion will be discussed.

Nonverbal cues associated with attention

The initial stage of information processing by receivers, attention, should certainly be affected by the nonverbal performance of the speaker. Unfortunately, little research has been done to ascertain which nonverbal cues may affect a receiver's attention level or how these cues affect attention. Although cognitive psychologists and learning theorists have devoted a great deal of research and discussion to issues concerned with attention (see Mostofsky, 1970, for a review), this literature has not considered how multi-channel communication affects attention level. In addition, communication researchers have not thoroughly investigated what impact multi-channel communication has on attention; with few exceptions they have researched only how certain vocal characteristics may arouse a receiver's attention or distract the receiver.

A number of studies (e.g., Diehl & McDonald, 1956; Glasgow, 1952; Woolbert, 1920) have found that variation in vocal pitch, rate, intensity, and voice quality improve message comprehension. This research suggests that the increased comprehension is due to attention arousal by variations

in these vocal cues. Unfortunately, none of this research has directly assessed receivers' attention level, so that it is not clear whether these vocal cues actually function as attention arousers or not. Other research has investigated how certain vocal cues may hurt comprehension, possibly by distracting receivers from messages. Results of these studies have shown that factors such as nonfluencies, mispronunciation, stuttering, certain simulated vocal qualities and pitch patterns do not significantly decrease message comprehension although listeners find such factors to be unpleasant (Diehl & McDonald, 1956; Kibler & Barker, 1972; Klinger, 1959; Utzinger, 1952). However, Diehl and McDonald (1956) did find that certain simulated vocal qualities (breathiness and nasalness) significantly decreased comprehension. Again, none of these studies directly measured receivers' attention level, so that it is unclear whether such cues actually affect attention. Thus, although this research suggests that some vocal cues may arouse receivers' attention, and that other vocal cues may distract receivers, there has been no direct evidence in support of these relationships. It may be that those vocal factors assumed to harm comprehension actually only moderately distract receivers, but not enough to damage comprehension.

Clearly, there are other nonverbal cues which may affect a receiver's attention. Vocal rhythm and regularity in phrasing, as well as the number and duration of pauses, may affect receiver attention. Nonverbal cues perceived visually by the receiver, including a number of head and facial variables such as speaker eye contact, facial expression, head movement such as nodding, speaker body cues such as certain hand gestures (e.g., illustrators, emphasisors), and posture shifts, may affect attention. Ekman and Friesen (1969) have suggested that a

speaker's use of illustrators may elicit visual attention from listeners. Indeed, any nonverbal cue that affects a receiver's interest and involvement in a message should impact the receiver's attention. Unfortunately, there is little empirical evidence to suggest which speaker cues actually affect receiver attention.

Albert and Dabbs (1970) have presented data which suggest that variations in interpersonal distance may affect a receiver's attention to and recall of a message. They reasoned that a far interpersonal distance would seem inappropriate to receivers and that a close interpersonal distance would be an invasion of the receiver's personal space. Both of these distances should have negative effects on message comprehension, while a middle distance would seem appropriate to receivers and facilitate message comprehension. Results of their investigation did find that receiver comprehension scores were highest at a moderate interpersonal distance, but unfortunately, were not significantly different from comprehension scores at either close or far distances. However, results also indicated significant differences in attention paid to the content of the message across distance categories: more attention was paid to message content at the middle distance than the far or close distances. Thus, although interpersonal distance may distract a receiver to some extent, the impact of this distraction does not seem to influence message comprehension.

Other nonverbal cues may, under certain conditions, provide sources of distraction for receivers. Unfortunately, just which cues, and what conditions, may cause a distractive effect has not been clearly delineated. Further, the possibility that the organization and combination of cues used by a speaker may affect receiver's attention level has not been considered.

Dynamic nonverbal cues, cues which involve movement and are received visually by listeners (e.g., hand gestures, body movements, facial-head activity, etc.), are one set of cues which have high potential for operating in either an attention arousing or distracting way. Because these are movement cues, they may attract listener attention and may be used to emphasize verbal content, or to distract a listener from message content. Additionally, the manner in which these cues are coordinated together and synchronized to the verbal stream, as well as the rate at which these cues are performed may affect receiver attention. Indeed, the fact that these cues are so closely coordinated to speech suggests that dynamic and rhythmic nonverbal cues may influence listener attention. These relationships will be discussed and considered further at a later point.

Nonverbal cues associated with comprehension

The possibility that a speaker's nonverbal performance may affect the comprehension of that speaker's verbal messages has been given some systematic attention by communication researchers. However, only certain channels, such as the vocal channel, have been investigated (though clearly such research on this channel has not been exhaustive) while other cues and channels have been anecdotally suggested to affect message comprehension. There has of yet, however, been no empirical test of such anecdotal suggestions. Further, researchers have not considered or assessed how multi-channel communication might affect message comprehension. Finally, how nonverbal cues operate to affect comprehension has not been clearly stated by researchers. There are at least two possibilities: (1) cues may act as attention arousers or distractors, as suggested earlier; (2) cues may have symbolic meaning in and of themselves that may be either

redundant with the co-occurring verbal message, augment that message, or conflict with that message. These functional possibilities have yet to be systematically considered.

As mentioned earlier in the section on attention cues, a number of studies have shown that variation in vocal pitch, rate, intensity, and voice quality enhance message comprehension (Diehl & McDonald, 1956; Glasgow, 1952; Woolbert, 1920). Other research on vocal characteristics that have been intuitively assumed to harm comprehension (poor vocal quality, pitch patterns, nonfluencies, mispronunciation, and stuttering) has shown that these vocal factors do not significantly interfere with message comprehension (Kibler & Barker, 1972; Klinger, 1959; Utzinger, 1952).

One particular vocal characteristic, vocal rate, has generated a fair amount of research on its effects on message comprehension. Results of this research are mixed and inconsistent. In a review of such studies, Foulke and Sticht (1969) stated that when results are found, most indicate lowered comprehension when rate of speech is rapid. Wheelless (1971) found lowered amount of comprehension in time-compressed speech messages. Other studies, however (Fairbanks, Guttman, & Miron, 1957; Orr, 1968), have shown that increased rate of speech has a facilitative effect on comprehension of messages. Despite the mixed results, Orr (1968) has concluded that increases in speech rate do not significantly reduce message comprehension, and that subjects often express a preference for a rate one and a half times faster than normal rate.

In summary, research on the effects of vocal cues on comprehension suggests that listeners are quite flexible, and that they can comprehend messages with almost normal accuracy under less than optimal vocal

delivery conditions (e.g., rapid vocal rate, stuttering, nonfluencies, etc.), although listeners may find some of these conditions unpleasant and may have negative perceptions of the source. However, this research may be criticized on at least two important points. One criticism to be made is that this research only considers the effect of one channel on comprehension and has not considered what the impact of the whole non-verbal message system might be, nor has the research considered the effects of the co-occurring verbal and nonverbal channels. Therefore, what information this research offers us about message comprehension in face-to-face communication is very limited. Listeners may not be so flexible when placed in communication situations where there are several co-occurring channels to deal with. Listeners may then have more information on different channels to process and may also face several sources of distraction in decoding and comprehending message content.

A criticism specific to the research on the effect of vocal rate on comprehension is that the manner in which vocal rate has been manipulated in several studies runs the risk of being artificial and not representative of vocal rates that occur in conversation. Several sources (Allen, Anderson, & Hough, 1968; Monroe & Ehninger, 1974) have estimated normal rates of speech to vary within a range of 120 to 180 words per minute (wpm). Such a range might be due to individual variation as well as regional differences. However, research on time compressed speech (e.g., Orr, 1968; Wheelless, 1971) reports vocal rates in these studies of over 300 wpm. It seems that if researchers are interested in the effect of vocal rate on comprehension in an everyday communicative sense, then rate should be manipulated at a level that conceivably occurs in conversation. The artificial nature of the time

compression rate technique calls into question whether such research is generalizable to face-to-face communication.

Other nonverbal cues have the potential to affect message comprehension, and several have been suggested in the literature to be related to this construct. As mentioned earlier, Ekman and Friesen (1969) have suggested that illustrative hand gestures are related to message comprehension. In addition to the possible attention arousing function, these gestures may also provide shared decoded meaning which may augment the verbal message or be redundant with the verbal message. Ekman and Friesen (1972) have argued elsewhere that these gestures aid the decoder in decoding messages, and that they serve a "self-priming" function which facilitates the verbal performance of the encoder. Cohen and Harrison (1973) found that subjects used more illustrators in face-to-face communication than over an intercom, which suggests that these gestures may be used in order to help a decoder, possibly in facilitating decoder message comprehension. A more recent study (Cohen, 1977) provides further evidence to suggest that these gestures aid decoder comprehension. Encoders used more illustrators in face-to-face interactions than in situations where encoding was done into an intercom or tape recorder. No research has been done, however, to determine if receivers actually benefit in terms of message comprehension from speakers' use of illustrators, or benefit in terms of any other receiver variable.

In a recent study, Gundersen and Hopper (1976) investigated what effects certain speech delivery factors might have on receiver comprehension of messages. The investigators manipulated the vocal volume, rate, voice quality, body posture, hand gesture and body movement in either an effective or ineffective manner. Results from this study as

well as a follow-up study indicated no effects for these delivery variables on recall and comprehension. The lack of effects might be explained by the way in which cues were manipulated. The cues were manipulated in an on-off, effective-ineffective manner. It is not clear whether a given operationalization of effectiveness or ineffectiveness for a given cue actually represents effective or ineffective use of that cue. For example, the effective manipulation of hand gestures consisted of the speaker using gestures spontaneously, while the ineffective manipulations consisted of the absence of such gestures. It seems that such manipulations, and indeed the investigation itself, do not consider important aspects of these delivery variables, such as the nature of the cue itself and the coordination of the cues together. Investigations of these aspects of delivery variables might yield different results.

Certainly, other nonverbal cues used by speakers have the potential to affect receiver message comprehension, although such cues have not received mention in the literature. Speakers' use of eye contact, well coordinated body movement, head and facial movement and expression may all potentially affect receiver comprehension. Those cues that are closely tied to speech may have the greatest potential to affect comprehension, either by arousing attention or by adding to, supplementing or emphasizing the verbal channel. Therefore, just how nonverbal cues like hand gestures, and indeed the overall nonverbal package, are tied to speech becomes important in determining nonverbal effects on message comprehension.

Nonverbal cues associated with persuasion

A growing area of research in nonverbal communication has begun to investigate the nature of nonverbal parts of messages during persuasive

discourse. Explanations of how nonverbal cues operate in persuasive attempts have centered on how such cues may bolster a communicator's credibility or make the communicator appear more confident, authoritative, attractive, or of higher status. Such explanations, then, simply posit that nonverbal cues only affect a receiver's impression of the source. Few researchers have considered whether or how nonverbal cues affect receivers' message yielding from an information processing point of view. Further, how the coordination of nonverbal cues together and their concomitant coordination to speech might affect receiver persuasion has not been considered. The present review section will identify what nonverbal cues have been associated with persuasion and finally consider how these cues, and the coordination of these cues, might affect persuasion from an information processing point of view.

In one of the initial investigations of nonverbal concomitants of persuasion, Mehrabian and Williams (1969) found that the set of cues used by speakers who intended to persuade, and the set of cues perceived by listeners as persuasive, have a high degree of commonality. Further, the study indicated that these cues are used with a higher than normal frequency, rate and intensity during persuasive attempts. For instance, such cues as a high degree of gesturing and facial activity, higher volume, greater fluency and faster vocal rate are all cues that are used by speakers intending to persuade and are seen as persuasive by receivers. It is worthwhile to note that many of the cues associated with persuasive intent as well as those perceived as persuasive are of a dynamic nature, involving a fair amount of rhythmic and forceful movement.

Maslow, Yoselson and London (1971) found that subjects were more persuaded by an individual confidently delivering an argument than by the same individual delivering the same argument neutrally or doubtfully. In a later study, Timney and London (1973) attempted to quantify possible nonverbal concomitants of confidence which would facilitate the success of a persuasive attempt. An informal analysis of the videotapes used in the earlier study revealed that in the confident condition, the speakers used movements that were rhythmical and forceful, they used a great deal of eye contact, and had a relaxed posture. In the doubtful condition, on the other hand, there was a great deal of fidgeting and self- or object-manipulative gestures such as pulling at the shirt collar, twirling a pencil, etc., there was a low amount of eye contact, and the speakers held a tense posture. This evidence led the authors to investigate the effectiveness of gesticulation, low amount of self-manipulation, and eye contact as expressions of persuasive confidence within interacting dyads. The dyads were given a legal case problem to solve and were instructed to act as a two-person jury and come to a common verdict. The use of gesticulation, self-manipulation and eye contact as expressions of persuader confidence was then assessed during interaction. Results of the study indicated that persuaders only used eye contact to a high degree during their interactions. There were no other significant effects in the study. The mixed results of the study are probably due to a couple of confounding problems. First, given the way the interaction task was assigned, it was not clear which individual in the interacting dyads was the persuader and which, the persuadee. These roles might very well have been interchanged several times during the dyad's deliberations, thus confounding the results of the study.

Second, the data from the study are based on only eleven dyads (22 individuals) due to a high degree of mortality during the experiment. This may not be a large enough population sampling for valid inferences to be made. Unfortunately, this study offers limited information about the use of these nonverbal cues during persuasion.

In a previously mentioned study concerned with the effects of speech delivery variables on speech effectiveness, Gundersen and Hopper (1976) assessed the impact of nonverbal and vocal delivery factors on the persuasive effect of the message as well as these factors' effects on comprehension. As stated earlier, holding the content of the persuasive message constant, Gundersen and Hopper manipulated the volume, rate, voice quality, posture, gesture and body movement of their persuasive encoders in either effective or ineffective ways. Results indicated no effects for the different delivery variables on attitude change. Of the source credibility dimensions measured, only the dynamism dimension showed any significant differences among the delivery conditions. A follow-up study was performed in which the content and composition of the message were slightly weakened in order to control for the possibility that the content and composition of the speech were so strong as to mask the effects of delivery variables and thus result in no effects in the first experiment. The data from this study were combined with the data from the first study and reanalyzed. Results indicated that delivery variables once again only affected the dynamism dimension of source credibility. As previously mentioned, a possible explanation for the lack of effects of the delivery variables in this study might be found in the manner of manipulation. The delivery variables were manipulated in an on-off, effective-ineffective fashion. There was no systematic

variation of the delivery variables in terms of degrees of intensity, frequency, rate or duration. Further, the coordination of these cues was not assessed or controlled. It seems possible, then, that the crucial aspects of these message delivery variables were not systematically manipulated by Gundersen and Hopper.

One recent study has made an initial attempt at exploring possible relationships between nonverbal visual cues operating as sources of distraction and resultant effects on comprehension and persuasion. Chaiken and Eagly (1976) investigated the effects of message mode (written versus audiotaped versus videotaped mode) on the comprehension of and yielding to counterattitudinal messages. Further, the study examined two possible explanations for modality differences in yielding: (1) a distraction explanation suggesting that both nonverbal, vocal, and visual cues may distract message recipients from content, reducing counterargument production and thus increasing persuasion. The authors suggested that the increasing number of nonverbal cues across written to audio to videotaped modalities would operate to diminish a receiver's critical abilities through distraction. Exactly how nonverbal cues would distract receivers, other than their mere presence, was not clarified. (2) that nonverbal cues function as communicator image bolsterers, enhancing aspects of a communicator (credibility, confidence) and thus increasing persuasion. Therefore, nonverbal expressions of confidence were manipulated within video- and audiotaped modalities by having the source deliver the message using either confident or non-confident tone of voice and gestures and posture.

The distraction-counterargument explanation would be supported if results indicated greatest agreement with the message, low amount of

counterarguing and greatest distraction in the videotaped mode, while audio and written modalities should result in lower agreement with the message, higher amounts of counterargument, and lower amounts of distraction. The authors suggested that the image bolstering-yielding explanation would receive support if the modality difference in yielding (video > audio > written) were maximized by confidently delivered messages, and minimized or reversed by nonconfidently delivered messages. Further support for the image bolstering explanation would be offered by higher source ratings in videotape than in audiotape or written modalities. If nonverbal cues simply operate to bolster a source's image, then an increase in the amount of cues, which occurs across modalities, should result in different levels of source ratings across modalities.

Another variable of concern in this study was complexity of the message. The investigators predicted that complex, difficult to understand messages would be comprehended best and therefore be most persuasive in the written mode since there is evidence to suggest that the written mode is superior for comprehension of complex material. Easily understood, simple messages were expected to be comprehended equally well across modalities, but that persuasion would be greatest in the videotaped modality, due to either the distraction or image bolstering effect. In addition to comprehension and persuasion, perceptions of the source, counterarguing, and perceived distraction were measured in the experiment.

Results of the study supported predictions for modality differences in persuasion and comprehension for both easy and difficult to understand messages. Predicted differences for communicator image due to manipulated expressions of confidence were not found. Additionally, there were no differences in overall source ratings across modalities.

Thus the communicator image bolstering explanation received no support. The predicted modality difference in yielding offered support for the distraction explanation, and suggests that the increasing number of nonverbal cues across the three modality conditions provided increasing sources of distraction. In addition, subjects reported the most distraction in videotaped conditions, followed by audiotaped and then written conditions. However, modality differences in counterargument were not found. Given that there are several problems in measuring counterarguing (Brandt, Dinkelacker, & Stoyanoff, 1977; Miller & Baron, 1973; Osterhouse & Brock, 1970), measurement problems might be an explanation for lack of effects on this variable. The authors also suggested that their message dealt with a topic that was not well-anchored and counterattitudinal enough to cause counterarguing to occur. Osterhouse and Brock (1970) have argued that a message must counter a well-anchored attitude in order for counterarguing to occur. Thus, the lack of a controversial and counterattitudinal topic might be another explanation for the lack of counterargument results.

In summary, no support was found for the communicator image explanation for message yielding, while partial support was obtained for the distraction-reduction of counterarguing explanation. The authors suggested that the relationships between nonverbal sources of distraction and message yielding be a topic of further and more thorough investigation (Chaiken & Eagly, 1976), a charge undertaken in the present investigation.

In another study which focused mainly on the vocal concomitants of persuasion and credibility, Baker (1965) investigated the effects of perceived speaker disorganization on speaker credibility and audience

attitude change. Subjects were presented with one of two forms of a counterattitudinal message. The two audiotaped messages were equivalent in terms of content, but speaker disorganization was manipulated by including a number of speaker disorganization cues in one of the messages. These cues were either verbal or nonverbal (vocalic) suggestions of the speaker's difficulty in presenting ideas systematically, and included apologies for not remembering points in the argument or for including an idea out of sequence, explanations for not placing material in proper sequence, and long silent pauses. The results of the study indicated that while the manipulated disorganization cues damage the perceived organization of a speaker, such cues do not reduce the credibility of the speaker. Further, attitude change was not negatively affected by the presence of the disorganization cues. It should be noted though, that this study assessed only a limited number of nonverbal cues, specifically, a few vocalic disorganization cues. Visual nonverbal cues, as well as other vocalic cues might alter the findings of this study.

A number of other studies have also assessed the effect of different vocalic cues, on credibility and attitude change. Sereno and Hawkins (1957) found that increasing nonfluencies do not detract from persuasive attempts, but that such nonfluencies do have negative effects on the competence and dynamism components of credibility. Similarly, Miller and Hewgill (1964) also found that increasing nonfluencies has a negative impact on competence and dynamism ratings of speakers. Pearce (1971) has shown that vocal cues used by speakers to produce a dynamic delivery style affect credibility judgements along the dimensions of trustworthiness, dynamism, and likeableness. A later study by Pearce and Brommel (1972) indicated that the vocal characteristics used in creating a dynamic style

(variations in pitch, volume, use of pauses, and rate) in combination with initial credibility induced through speaker introduction, affect a message's persuasive impact. The mixed nature of the results of these studies makes conclusions about the impact of vocal cues on persuasion difficult and tentative at best. The evidence does clearly indicate that vocal cues impact a receiver's credibility ratings of a speaker.

One other vocal cue, speech rate, has received some empirical attention in terms of how it alone might affect receiver persuasion. Miller, Maruyama, Beaber, and Valone (1976) assessed the effect of increased rate of speech on both communicator credibility and receiver yielding to a counterattitudinal message. They discussed three alternative explanations for the effect an increased rate of speech might have on message yielding: (1) a fast speaking rate may disrupt any covert attempt to counterargue the content of a persuasive counterattitudinal message, and thus increase persuasion; (2) a fast speaking rate may simply function as a credibility cue, increasing the credibility of the source, and thus increasing persuasion; and (3) a fast speaking rate may enhance persuasion as a consequence of a decoder's increased effort required to comprehend the message. Miller et al. performed two experiments to determine the effects of increased rate of speech on credibility and yielding and to determine which of the first two explanations (distraction from counterarguing and credibility bolstering) might receive empirical support. The third explanation was offered as a post-hoc alternative. Results of the two experiments demonstrated that increased speech rate has a facilitative effect on both attitude change and credibility. Miller et al. claimed support for the credibility bolstering explanation and discounted the distraction explanation. They

argued that different predictions would be made by the distraction-counterargument disruption and credibility explanations when a speaker's initial level of credibility is taken into account. Supposedly the distraction explanation would predict that initially high credible sources should be much more persuasive speaking at fast vocal rates than initially low credible sources, thus producing an interaction between initial credibility level and rate of speech. This prediction is based on the rationale that counterarguing is the most viable mode of resistance only when speakers are initially highly credible. Receivers may resist speakers lacking credibility by using less elaborate internal responses than counterarguing, such as simply rejecting or discounting what has been said in the message.

On the other hand, according to Miller et al., a credibility bolstering explanation would not predict such an interaction, but only main effects for vocal rate on credibility and persuasion. Their results failed to show an interaction between initial credibility and vocal rate and thus they discounted the distraction explanation and claimed support for the credibility bolstering explanation.

Claiming support for the credibility bolstering explanation may be premature for a number of reasons. First, it is not clear that failure to find the expected interaction constitutes lack of support for the distraction-counterargument disruption explanation. There may be a number of other reasons for the lack of the interaction which Miller et al. fail to discuss. This is plausible given conflicting results found elsewhere (e.g., Pearce & Brommel, 1972). Second, neither the occurrence of counterarguing, nor the message's impact on comprehension or distraction was assessed in the experiments. In order to discount

either the distraction or effort explanations, the effect of rate on distraction, counterarguing, comprehension and effort should have been assessed.

The results showed that increased vocal rate positively facilitates credibility as well as persuasion, as indicated by a main effect for rate on both of these variables. However, the generalizability of these results may be called into question. As reported earlier, estimated range of conversational rate is between 120 and 180 wpm. Miller et al. reported a low speed vocal rate manipulation of 102 wpm, a rate that is possibly unrepresentative due to being too slow and thus biasing the results of the studies. Despite the unrepresentative manipulation of rate, the results of this study do suggest that increased vocal rate may have an impact on credibility and persuasion. However, the underlying explanation for such effects was not further clarified by this study.

In summarizing the literature on nonverbal concomitants of attention, comprehension and persuasion, it is apparent that the literature lacks theoretical integration and empirical consistency. Much of the research does not seem to be theory based, and there is certainly a lack of empirical information concerning the effects nonverbal cues may have on some of the constructs of interest (particularly attention and comprehension). A number of the studies reviewed indicated that nonverbal cues had no effect on attention, comprehension or persuasion. However, when effects were found, some consistency across studies is noticeable. Direct evidence on nonverbal cues that affect attention is sparse, although varying such vocal cues as pitch, rate, and intensity and using illustrative hand gestures has been suggested as attention

arousing cues. There is also a limited amount of research concerned with nonverbal concomitants of comprehension. Variations in the vocal characteristics which are assumed to arouse attention do enhance message comprehension. Again, use of illustrative hand gestures has been suggested to affect message comprehension. The evidence concerning nonverbal concomitants of persuasion is mixed. A high degree of hand gesturing and facial activity, higher volume, greater fluency and faster vocal rate are cues associated with persuasive intent and are also perceived as persuasive. Pearce and his associates found that dynamic vocal style variables influence the persuasive impact of a message. However, how such cues operate to facilitate attitude change has not been clarified.

When effects are found, many of the same nonverbal cues appear to be important concomitants for all three of the information processing stages. Vocal rate and vocal intensity are important to all three stages. Some form of hand gesturing has been shown to be associated with persuasion, and suggested to affect attention and comprehension. Vocal pitch may affect attention and has been shown to affect comprehension, while vocal fluency and facial activity affect a message's persuasive impact.

It is suggested here that one common attribute of this set of cues is that they are dynamic in nature. Other cues which have the potential to affect attention, comprehension or persuasion may well also be dynamic in nature. The pattern of mixed results found in the review of the literature might best be explained from an information processing point of view which takes into account the dynamic nature of coverbal cues and the impact they have on information processing stages. All of these cues have yet another quality in common, that being that they are all very closely coordinated to the verbal channel. The nature of that coordination is to be discussed in the next section.

Behavioral synchrony: the coordination of multi-channel systems

Recently, there has been an intensifying interest in the organization and coordination of communicative behavior. Scholars from a number of diverse disciplines such as developmental psychology, linguistics, social psychology, and human communication have begun to ask questions about how speakers and listeners organize their communication messages. As a result, some of the research has produced information concerning the manner in which speakers coordinate their nonverbal cues, and how those cues are coordinated to the verbal stream. Thus, this research deals with the organization of multi-channel communication. The research indicates that a speaker's nonverbal cues are coordinated with each other across time, and are "synchronized" to the verbal stream. This state of coordination has been termed behavioral synchrony.

There have been several different aspects of synchrony researched in the literature. Some aspects of synchrony involve not only speaker behavior, but listener behavior as well, and the relationship between the two sets of behavior. The present investigation, however, is primarily concerned with how speakers synchronize their own nonverbal cues. Kendon (1970) has investigated one aspect of synchronous behavior termed self-synchrony. Self-synchrony is defined as the nonverbal movements of a speaker being synchronized with the verbal stream. Specifically, Kendon found that the points of change in body movement coincided with the points of change in the flow of verbal sound, and that larger body movement waves fit over larger segments of speech, such as words or phrases, and that smaller movement waves fit over smaller segments of speech, such as syllables, and subsyllabic changes. Dittmann (1972) has also found that there is a relationship between the speech rhythm and body movement of

speakers, and that coordination occurs at the phonemic clause level. Briefly, a phonemic clause may be defined as a unit of spontaneous speech characterized by rising intonation and loudness patterns and a primary stress point at the end of the clause. A more detailed description will be provided at a later point. This research indicates a coordination and synchronization of the flow of body movements of a speaker to the stream of speech on several levels up to and including the phonemic clause level (Dittmann, 1966). Basically, then, a speaker's body movements and other nonverbal (coverbal) activity are organized and coordinated to the rhythmic flow of speech.

Based on this research, some important distinctions about the synchronous process may be made. Although it has not been clearly pointed out by synchrony researchers, behavioral synchrony is tied to the immediate rhythmic and temporal aspects of the voice. The work cited by Dittmann and Kendon involves the coordination of speakers' nonverbal activity to the rhythm of speech. Another distinction to be made is that the nonverbal behaviors involved in the synchronous process are of a moving, dynamic character. Specifically, this class of dynamic behaviors includes such facial-head activity as head nodding, head shaking, head tilting, and shifts in eye contact (Kendon, 1970). Gestural activity, such as those hand movements termed illustrators (Ekman & Friesen, 1969), as well as body movements and body position shifts, are also dynamic behaviors synchronized to the rhythm of speech production. Importantly, it should be pointed out that a finer distinction may now be made about behaviors and the cues of interest here. The present investigation is not just dealing with coverbal cues, or dynamic cues, but coverbal dynamic cues that are synchronized to the rhythm of speech. In summary,

synchrony is seen as a process where rhythmic aspects of the stream of speech (vocal stress patterns) act as a metronome for the organization of speakers' dynamic coverbal behavior.

Central to the present conceptualization of conversational synchrony is the rhythmic character of the voice itself. A number of investigators (Abercrombie, 1969; Allen, 1972; Anderson, 1975; Martin, 1972) have concluded that the periodic reoccurrence of linguistic stress produces the rhythmic nature of verbal language. The stress patterns articulated in speech production, then, produce the rhythm of the voice and provide the rhythm to which speakers' dynamic nonverbal behavior is coordinated.

A unit of spontaneous speech, which is involved in the rhythmic character of vocalization and which has been linked to the synchronous process, is the phonemic clause. First identified by Trager and Smith (1951), Boomer (1978) describes the phonemic clause as a discernable "chunk" of speech occurring in sustained, spontaneous speech. Further, phonemic clauses are marked off in vocalization by several physical features of the voice: pitch, loudness, and rhythm. Several linguists (Crystal, 1969, Halliday, 1963; Trager & Smith, 1951) have investigated and found that characteristic patterns of pitch (or intonation contours or patterns), loudness, and rhythm are associated with phonemic clauses. For example, consider the utterance:

the man who called me yesterday / just telephoned again/

When verbalized, the utterance has two phonemic clauses which are distinguished by two distinct intonation patterns (rising over both clauses), two distinct loudness patterns (rising gradually over both clauses), and two distinct stress patterns (with stress emphasis on "yesterday" and "again"). Finally, it should be noted that "yesterday"

and "again" are the points in the phonemic clauses where all three patterns (pitch, loudness, rhythm) change simultaneously. As a consequence, these points "stand out," and are termed primary stress points. Primary stress is another identifying feature of phonemic clauses. This brief identification of phonemic clause characteristics is not meant to be exhaustive. However, the terms presented adequately describe phonemic clauses for the purposes of the present study.

There are several important aspects of phonemic clauses for the present investigation. Phonemic clauses are involved with the rhythmic production of speech (Boomer, 1978) since stress, and primary stress in particular, are defining characteristics of this phenomena. Phonemic clauses are also involved in cognitive encoding of speech in that they constitute a linguistic unit. Evidence exists (Boomer, 1965) which suggests that speakers cognitively plan verbalization in phonemic clause units, and that listeners may decode verbalization in phonemic clause units. Further, research has shown that speakers (Dittmann, 1972) and listeners (Dittmann & Llewellyn, 1968) coordinate their nonverbal behaviors to the stress patterns within phonemic clauses. In addition, within phonemic clauses, the word which usually receives the primary stress is typically the highest "information word," in contrast to "function" words which serve to hold the information words together (Rosenfeld, 1978). It seems, then, that within these rhythmic units called phonemic clauses there is quite a lot of nonverbal activity coordinated to the stress patterns, particularly at primary stress points where high information words occur. Kendon (1972, 1973) has shown that distinctive movements characterizing a given phrase are predominantly organized around or "peak at" the major primary stress,

which co-occurs with high information words in phonemic clauses. Indeed, many of the hand gestures termed illustrators, emphasisors, or accentuators by Ekman and Friesen (1969) may occur in close proximity to, or simultaneous with primary stress in phonemic clauses.

In summary, much of the literature about behavioral synchrony, vocal rhythm and phonemic clauses may offer insight into the nature of message exchange in multi-channel systems. Speakers, as well as listeners, coordinate much of their coverbal activity to the stress patterns or vocal rhythm of the voice. Within phonemic clauses, which are defined by stress patterns and other vocal characteristics, coverbal activity peaks at primary stress points where high information words occur.

There are several implications to be drawn concerning the effect the synchronization process has on the attention level of receivers, message comprehension and yielding by receivers. One point to be made is that the synchronizing process should facilitate encoding of the message by the speaker, facilitate decoding of the message by the listener, and thus facilitate information exchange between speaker and listener. The synchronizing process allows a speaker to encode a message in a very organized, coordinated and effective way. Indeed, when speakers encounter difficulty in encoding a message (as indicated by nonfluencies and perceptible breaks in speech rhythm), nonverbal movements such as hand gesturing and other activity bunch up or cluster around nonfluent vocalization and hesitation points (Dittmann & Llewellyn, 1969). Speakers seem to be attempting to facilitate or "self-prime" the encoding of the message by the use of nonverbal activity such as hand gestures and body movements (Dittmann, 1972). Thus, the coverbal dynamic aspects of a speaker's performance are very involved in verbal message encoding, and

may have a facilitative effect on verbal message encoding. But more importantly, a synchronized message, i.e., an organized and coordinated speaker performance, should facilitate the reception of the message by a listener. A synchronized message should heighten a receiver's attention to and comprehension of a message for a number of reasons. One reason may be that because all of the various coverbal channels (head-facial activity, body activity, hand activity) are well organized and coordinated to the verbal channel through vocal rhythm, the overall message should be easier for the receiver to process and thus comprehend better. Another way of stating this is that a synchronized, well-coordinated message provides minimal sources of distraction for the receiver, is simpler to process, and is more comprehensible.

A connected point to be made involves the coordination of nonverbal activity within phonemic clauses. Since a major amount of coverbal activity, such as hand gesturing, occurs at primary stress points within phonemic clauses, it is possible that such coverbal activity serves to emphasize and accentuate those high information segments of the message. Thus, this activity would operate to call attention to these high information segments and point out their importance to the listener. This indicates another way in which the synchronization of a message may affect receiver attention and comprehension.

Finally, messages which lack synchronization, where coverbal behaviors are not well-coordinated to vocal rhythm, should be difficult for receivers to process. Lack of synchrony should distract listeners from verbal content to the point of learning very little of the verbal content at all. Receivers should focus on the dissynchronous aspects of the speaker's performance and be distracted to a large extent from the verbal message

content. Comprehension of the message, as a result, should clearly suffer.

An extension of this reasoning can be made to situations where dynamic coverbal cues are not performed. Given that synchronized coverbal cues do facilitate message comprehension by emphasizing important message segments, possibly adding information, and contributing to overall message organization, an absence of such cues during message reception should result in lower comprehension. Absence of synchronized cues may be simply due to non-performance of those cues by a speaker, or to the reception of a message on the audio or vocal and verbal channels only. Indeed, speakers who are often perceived as boring and uninteresting may not utilize dynamic coverbal cues effectively. Further, since much of the research on message comprehension has been concerned only with the vocal channel, comparisons between audio only and audio plus visual message versions might prove interesting, and show the effects that dynamic coverbal cues have on message comprehension. This comparison might also indicate to what extent the research that focused only on the vocal channel may be unrepresentative of message comprehension in face-to-face interaction.

A consideration of how message synchronization might affect receiver yielding to counterattitudinal messages involves factors in addition to behavioral synchrony itself, specifically vocal rate and coverbal cues operating as distractors. As noted earlier, increased vocal rate has been consistently associated with persuasiveness, as have a number of visual dynamic coverbal cues (forceful, rhythmic hand gestures, facial-head activity, etc.). Within a multi-channel message system, it is unlikely that any given cue operates in a strong enough manner to

influence receiver attitudes by itself. Miller et al. (1976) make a claim for the singular effect of vocal rate on persuasion. Given the reasoning here, such a claim is suspect. As this rationale suggests, it is more likely that a number of cues in combination, or a package of cues, affects a receiver's susceptibility to influence. Thus, when the above coverbal cues are synchronized to the vocal rhythm at normal conversational speaking rates, they may operate to emphasize, accentuate and add information to the verbal content of the message, as argued above. Given that the message is counterattitudinal, the receiver should be motivated to counterargue and resist influence under such conditions. However, when synchronized to the vocal rhythm at increased speaking rates, these coverbal cues may provide moderate sources of distraction. The receiver is faced with an oncoming multi-channel message delivered at a higher than normal rate of speed. Paying attention to the message involves processing more nonverbal as well as verbal information within a shorter span of time. The increasing rate and rhythm of synchronized coverbal cues should subdivide receiver attention and moderately distract the receiver from message content. Further, within the context of an increased rate message, the major amount of coverbal activity that occurs at primary stress points within phonemic clauses may operate to distract the listener from high information message segments.

In summary, the degree of synchronization of a message, as well as the rate at which it is presented, should affect receiver attention, comprehension and yielding to counterattitudinal messages in systematic ways. An important consideration for these processes is the nature and extent of distraction that co-occurs with message reception.

Distraction: mediational effects on information processing

A good deal of research in the attitude change and persuasion literature has been concerned with the role that distraction plays in making communicators more susceptible to influence (e.g., Baron, Baron, & Miller, 1973; Festinger & Maccoby, 1964; Osterhouse & Brock, 1970). This research suggests that sources of distraction may increase yielding to counterattitudinal messages by dividing the attention of the listener, disrupting the listener's ability to scrutinize oncoming verbal information and generate counterarguments, and thus increasing the listener's susceptibility to influence. However, as Burgoon, Cohen, Montgomery, & Miller (1978) have pointed out, most of these investigations have not dealt with the kinds of distractions that normally occur in sequential message reception. Distraction manipulations have taken the form of flashing lights, racing slot cars, irrelevant films, etc. Few investigations have explored the possible sources of distraction within messages, and specifically those that are nonverbal in nature (the exceptions being Chaiken & Eagly, 1976; Miller et al., 1976; and Burgoon et al., 1978).

One of the conditions specified by Osterhouse and Brock (1970) for a distraction effect to occur is that the distraction not be so severe as to inhibit reception of arguments in a message, but strong enough to disrupt subvocal counterarguing. Zimbardo, Snyder, Thomas, Gold, and Gurwitz (1970) found that engaging in an irrelevant, distracting task while processing a counterattitudinal message resulted in increased attitude change when receivers were set to attend primarily to the messages (message set). Opposite results were obtained when receivers were set to attend primarily to the distracting task (distractive task set). Receiver set was manipulated by instructing subjects to attend primarily to the persuasive message or to the distracting task. Thus, the intensity

of the distraction as well as a receiver's set (message or distracting task) are important considerations for distraction effects.

Burgoon et al. (1978) have suggested that receivers may be induced to be critical of or focus in on source and delivery components of a counterattitudinal message. Such an inducement results in a message set where receivers attend primarily to the message but are distracted by the delivery components. Thus, receivers may be moderately distracted from the content of the persuasive message and counterarguing inhibited as a result. An important question to task is whether receivers must be specifically instructed or induced to be critical of delivery of the message, or whether there are aspects of the message itself which provide such inducements. Indeed, in everyday interaction it is unlikely that a receiver would receive an external instruction or inducement prior to reception of a persuasive message.

The present rationale suggests that synchronized coverbal sources of distraction, as discussed earlier, may be well suited as moderate distractors and may provide inducements for focusing on the source and delivery components of a counterattitudinal message. Dynamic coverbal cues at increased rates should distract receivers by focusing their attention toward the delivery components of the message and away from the content of the message, particularly at high information segments. Further, the level of distraction provided by the cues at increased rates should be moderate and not significantly interfere with message comprehension. As such, although no receiver set is induced prior to message reception, a message set should develop during message reception.

Sources of distraction which are strong and intense may result in different effects. Nonsynchronized delivery components of messages may constitute strong sources of distraction and may operate to focus receiver

attention completely on message delivery components and completely away from message content; under such conditions receiver comprehension of the message should be low. The receiver set developed here would be a distracting task set.

A well-synchronized message, presented at a faster than normal rate of speed should provide moderate sources of distraction. The synchronized dynamic coverbal cues (e.g., hand gestures, body movements, face-head activity) should act to subdivide receiver attention away from message content and towards delivery components of the message, inhibit counterarguing, and make the receiver susceptible to influence. Nonsynchronized messages, because they provide strong sources of distraction, should highly distract the receiver to the extent that it is very difficult to attend to message content. Under these conditions, comprehension of the message content should be low. Several authors (Baron, Baron, & Miller, 1973; Osterhouse & Brock, 1970) have suggested that if message comprehension is significantly reduced, no attitude change effect will occur. Given that receivers comprehend very little of the persuasive message, it is unlikely that the message can have any persuasive effect. Additionally, when presneted with a dissynchronous message, receivers should focus on the uncoordinated coverbal aspects of the message. Counterarguing, in terms of source derogation, might be facilitated under these conditions. (Miller & Baron, 1973, have argued that source derogation is a component of counterarguing.) Thus, by severely inhibiting message comprehension and concomitantly facilitating source derogating counterargumentation, receivers should be made more resistant to influence.

An extension of this rationale can be made to message in which dynamic coverbal cues are not performed. Given that synchronized coverbal cues presented at fast rates do distract receivers, inhibit counterarguing,

and make receivers more susceptible to influence, an absence of these cues during reception of counterattitudinal messages should result in receivers being more resistant to influence. Under such conditions, receivers should be less distracted, counterargue more, and be more resistant to the persuasive impact of the message. Absence of synchronized dynamic cues may be due to non-performance of those cues by a speaker, or to the reception of the message on the audio or vocal and verbal channels only. Speakers who encode messages at fast rates, but do not utilize synchronized coverbal cues should be less persuasive than speakers who do utilize such cues at fast rates. Further, counterattitudinal messages presented at an increased rate on the audio channel only should have less persuasive impact than similar messages presented on the audio and visual channels which contain dynamic coverbal cues. Chaiken and Eagly's (1976) finding of modality differences on persuasion offer additional support for the expected channel differences in yielding.

Summary and Statement of Hypotheses

An information processing perspective that takes nonverbal communication into account may offer new insight into the comprehension of and persuasive efficacy of orally delivered messages. Although other explanatory viewpoints have been offered (e.g., effort and image bolstering explanations), an information processing viewpoint should best be able to specify relationships between verbal and nonverbal message characteristics and how such factors affect the cognitive processing of information.

A consideration of the different explanatory viewpoints in light of the literature review and the present rationale may offer further information. The effort explanation predicts that the more effort a receiver expends in comprehending and processing a message, the better the receiver will comprehend the message and be influenced by it. Thus, the more

difficult a message is to comprehend and process, the more effort a receiver expends in comprehending and processing. As a result, more difficult messages (difficult in terms of comprehending and processing) should have greater impact in terms of comprehension and receiver yielding. The literature that is available does not support these predictions very well. Particularly, since Eagly (1974) has shown that difficult and easy to comprehend messages do not differentially affect receiver effort, support for the effort explanation seems lacking.

The image bolstering and information processing explanations have received more empirical attention and support in the literature. The image bolstering explanation suggests increases in comprehension to be facilitated by increasing a source's communicator image and making reception conditions pleasant for receivers. Available evidence indicates minimal support for this prediction. Research on how vocal effects may harm comprehension (Diehl & McDonald, 1956; Kibler & Barker, 1972; Klinger, 1959; Utzinger, 1952) indicated that although subjects found nonfluencies, mispronunciations and stuttering to be unpleasant, such conditions did not negatively affect message comprehension. However, Eagly (1974) has suggested pleasantness of reception conditions to affect message comprehension, but has not specified what pleasant reception conditions might be. Similarly, while the image bolstering explanation predicts that increases in attitude change should be facilitated by bolstering a source's credibility and perceived confidence ratings (Maslow et al., 1971; Miller et al., 1976; Pearce, 1971; Pearce & Brommel, 1972), it is not clear that simply bolstering a communicator's image functions to increase persuasion.

An information processing approach which shows how coverbal cues and other message characteristics affect comprehension and persuasion is suggested to provide a better explanatory viewpoint than the other

alternatives. Available evidence suggests that coverbal cues like hand gesturing may serve to emphasize and add information to the verbal content, thus facilitating message comprehension. Further, the way in which coverbal cues are organized and synchronized to the verbal stream suggests that these cues function in an emphasizing and informative way.

In terms of persuasion, a distraction-counterargument inhibition explanation may have an advantage in that it takes variables like distraction and counterarguing into account. Instead of assuming that certain cues function to bolster communicator image and thus persuade, it is more likely that the coverbal cues that contribute to better image ratings operate to focus receivers on delivery components of the message and away from the verbal content, thus distracting receivers, inhibiting counterarguing, and making receivers susceptible to influence. In light of recent evidence by Chaiken and Eagly (1976), and Burgoon, et al. (1978), such a view receives additional support.

The set of cues that have the highest probability of affecting receiver attention, comprehension, and persuasion are coverbal cues, as defined by Markel (1975). Some finer distinctions may be made about this important set of cues, that is, that they are dynamic in nature and are synchronized to the vocal rhythm of speech. The profile of cues generated by the review of literature supports this assertion. Hand gestures, facial and head activity, and body movement are all dynamic cues that have been shown to be synchronized to vocal rhythm. Further, these cues have been shown to affect, or at least have the potential to affect, attention, comprehension and yielding.

The effect of multi-channel communication on the attention, comprehension, and persuasion of receivers is suggested here to be important.

Much of the existing literature has considered only a single cue or channel and ignores the effect on these constructs of simultaneous messages across different channels. Thus, this literature offers little information about the nature of message exchange and reception in interactional situations. Behavioral or message synchrony, which is the organization and coordination of different dynamic cues, across various channels, that are tied to the verbal stream, is an important multi-channel message construct. It is suggested that behavioral synchrony will affect information processing and subsequent communication outcomes.

Several relationships have been posited which may now be summarized. Synchronized coverbal cues should facilitate message comprehension by emphasizing important message segments, possibly adding information, and contributing to overall message organization. Thus, synchronized messages should be easier for the receiver to process and comprehend. On the other hand, dissynchronous messages, where coverbal cues are not coordinated to vocal rhythm, should distract listeners from message content to a great extent, and as a result, message comprehension should be very low. More formally:

H1: Synchronous messages will result in significantly higher message comprehension than dissynchronous messages.

Given that synchronized coverbal cues do facilitate message comprehension by emphasizing important message segments, adding information, and contributing to overall message organization, comparisons can be made between messages which contain synchronized cues and messages which do not contain those cues. Additionally, predictions can be made about such comparisons. Absence of synchronized coverbal cues should result in lower

message comprehension because of a loss of the emphasizing, informative and organizational functions that these cues may perform. The absence of these cues may be due to non-performance by the speaker, or to the elimination of the visual channel, that is, a message on the vocal or audio channel only. Hypotheses 2 and 3 are concerned with these comparisons.

H2: A message containing synchronized coverbal cues will result in significantly higher message comprehension than a message in which synchronized cues are not performed.

H3: A message containing synchronized coverbal cues (a message with both vocal and synchronized visual channels) will result in significantly higher message comprehension than a message on the vocal channel only.

The relationships between message synchrony, rate of presentation, distraction, counterarguing, and receiver yielding are expected to be the following. It should be noted here that although the predicted relationships are interactive, differences between synchronous and dissynchronous messages should be strong enough to result in main effects for synchrony. However, these main effects should be overridden by the predicted interaction effects.

Synchronized coverbal cues, when presented at increased rates of speed, should provide moderate sources of distraction. Thus, such message presentations should focus receiver attention away from message content and on the delivery components of the message (the cues themselves). This distractive effect should inhibit receiver counterarguing and make receivers susceptible to influence. Synchronous messages presented at normal rates should provide minimal amounts of

distraction, should not subdivide receiver attention or inhibit counter-arguing and thus should not make receivers susceptible to influence. Dissynchronous messages, regardless of rate, should provide a high amount of distraction, should increase source derogating counter-arguing, and make receivers more resistant to influence; that is, their attitudes on the counterattitudinal topic may show a slight boomerang effect. Hypotheses 4, 5, and 6 predict interaction effects for message yielding, distraction and counterarguing, respectively.

H4: Subjects receiving a synchronous fast rate message will yield significantly more than subjects receiving a synchronous normal rate message, a dissynchronous normal, or a dissynchronous fast rate message.

H5: Subjects will be highly distracted by dissynchronous messages regardless of vocal rate, while subjects receiving a synchronous fast rate message will be moderately distracted, and subjects receiving a synchronous normal rate message will not be distracted.

H6: Subjects receiving a synchronous fast rate message will engage in significantly less counterarguing than subjects receiving a synchronous normal rate message, or a dissynchronous message regardless of rate.

Given that synchronized coverbal cues presented at a fast rate do result in attitude change on counterattitudinal topics, comparisons can be made between messages presented at a fast rate which contain

these cues and messages presented at the same rate which do not contain these cues. Additionally, predictions can be made about such comparisons. Absence of synchronized coverbal cues at increased rates should result in less attitude change because of a loss of the distractive, counter-argument-inhibiting function that these cues may perform. The absence of these cues may be due to non-performance by the speaker, or to the elimination of the visual channel; that is, a message on the vocal and verbal or audio channel only. Hypotheses 7 and 8 are concerned with these comparisons.

H7: A message containing synchronized coverbal cues presented at a fast rate will result in significantly higher attitude yielding than a fast rate message in which synchronized coverbal cues are not performed.

H8: A fast rate message containing synchronized coverbal cues (a message with both a vocal and a synchronized visual channel) will result in significantly higher attitude yielding than a fast rate message on the vocal channel only.

CHAPTER II

METHOD

Subjects

Subjects were 274 students enrolled in basic speech courses at the University of Florida. Participation in the experiment was on a credit given basis.

Procedure

Upon arrival at an experimental lab, subjects were informed that the Center for Communication Research was interested in how people receive and react to recorded messages. Further, subjects were told that shortly they would receive a message, were requested to pay attention to the message, and that afterwards, the experimenters would be interested in their evaluations. Subjects then read and filled out informed consent forms.

Subjects were then individually assigned to experimental testing rooms on a random basis, where they were exposed to either a videotaped or audiotaped version of a counterattitudinal message. Subsequent to exposure to the message, subjects were taken to post-experimental rooms where post-experimental measures were administered. Additionally, some subjects were randomly assigned to a control group which received no message. Control subjects were told that they had been chosen to simply respond on some written forms, and then were administered a series of attitudinal measures, one of which measured subjects' attitudes on the

experimental message topic. All participants in the experiment were debriefed after completion of the study.

Design

A post-test-only design was employed in the present investigation. This design was used primarily for one main reason, that being to avoid sensitizing subjects to the attitudinal topic by using pre-tests. Campbell and Stanley (1963, p. 26) have suggested this design to be appropriate when pre-tests are likely to be reactive. Burgoon and King (1974) have suggested that pre-tests may inoculate subjects against subsequent persuasive attacks by heightening their awareness of the topic, possibly influencing them to seek additional information to support their beliefs, as well as preparing counterarguments to refute a forthcoming attack. In order to avoid such problems, a post-test-only design was deemed appropriate for the study.

Subjects were randomly assigned to one of eight experimental encoding conditions ($N = 245$). Six of the encoding conditions were presented in videotape mode ($N = 178$), and two conditions were presented in audiotape mode ($N = 67$). Additionally, a no message control condition was included in the design ($N = 29$). In the videotape mode, subjects received the message via a videotape recorder and television monitor, while subjects received the message via an audiotape cassette recorder in the audiotape mode. Within the videotape mode encoding conditions, synchrony was manipulated on three levels (in-sync, out sync, and no sync). Rate of presentation was manipulated on two levels (normal rate and fast rate) in both videotaped and audiotaped encoding conditions. This constitutes a 3×2 factorial design for videotaped experimental encoding conditions. A 2 (normal vs. fast rate) $\times 2$ (videotape vs.

audiotape mode) factorial design was used to analyze for differences between modes of presentation. All eight experimental conditions were performed by two different speakers to control for global responses by subjects to some idiosyncratic aspect of a particular speaker. Thus, the design was counterbalanced for speakers. A blocking effect for speakers was included in all initial statistical analyses. When the blocking effects resulted in F values of less than 1.00, the effects were dropped from the analysis (as suggested by Snedecor & Cochran, 1967). A summary of the design and conditions may be seen in Table 1.

Message and Videotape Construction

A counterattitudinal message presenting four main arguments for a 20% increase in undergraduate tuition was used in the study. Sampling of another undergraduate subject population ($N = 65$) on attitude towards a 20% increase in undergraduate tuition had indicated that a message arguing for the increase would be counterattitudinal. This sample's responses towards the topic on three different measures (a Likert type agree-disagree dimension, four semantic differential dimensions, and the Known Interval scale, Burgoon & Burgoon, 1977) indicated negative evaluations and disagreement with the topic ($\bar{X}$ for agree-disagree dimension = 2.10 with a range of 1-7; $\bar{X}$ for semantic differential items = 9.62 with a range of 4-28; $\bar{X}$ for Known Interval scale = 3.62 with a range of .66-11.21).

The experimental message was carefully constructed to control for certain language variables known to affect a message's comprehensibility and persuasibility. The message consisted of 34 sentences and a total of 677 words. The average sentence length (asl) for the message was 19.91 words. Sentence length has been related to ease of comprehension

TABLE 1
EXPERIMENTAL ENCODING CONDITIONS

Condition	Rate	Synchrony	Mode of Presentation
Condition 1	Normal	Synchronous	VTR
Condition 2	Normal	Dissynchronous	VTR
Condition 3	Normal	No Cues	VTR
Condition 4	Fast	Synchronous	VTR
Condition 5	Fast	Dissynchronous	VTR
Condition 6	Fast	No Cues	VTR
Condition 7	Normal	---	Audio
Condition 8	Fast	---	Audio
<u>Control Conditions</u>			
Condition 9	No message control group		

of messages, and the *asl* of the present message compares favorable with the *asl* of messages used by Burgoon et al. (1978) which have been shown to be highly comprehensible as well as persuasive (*asl* for the two messages used in that study were 21.20 and 24.68 words). Another index of a message's comprehensibility is the Index of Contingency (Becker, Bavelas, & Braden, 1961). This index is sensitive to the repetitiveness of nouns in a message and thus indicates a message's redundancy. The greater the noun repetitiveness and thus the redundancy in a message, the more comprehensible the message should be. The message used in the present study has a Contingency Index of 2.23, an index value that indicates the message would be rated as moderate in terms of comprehensibility.

The intensity of language used in a message has been shown to mediate persuasion (Bowers, 1964; Burgoon & Miller, 1971). Thus, the language used in the experimental message was moderately intense in order to avoid the ineffectiveness of language too low in intensity and the reactive and boomerang effects of highly intense language. Language intensity of the message was controlled by a subjective review procedure described below. Reviewers were instructed to evaluate and control for use of highly intense metaphors (Bowers, 1964) and extremely intense levels of adverbial qualification (Burgoon & Miller, 1971).

A draft of the message was submitted to a panel of four speech instructors for review. The panel evaluated the message in terms of appropriate language intensity, correctness of grammar, and overall understandability and persuasiveness. The panel's evaluations and corrections were taken into account in the final form of the message. The complete message is contained in Appendix A.

A videotape methodology was utilized to deliver the message to subjects in the present study. Videotape delivery was chosen over a live delivery

for several reasons. First, manipulating the levels of synchrony (i.e., synchrony and dissynchrony) proved to be very difficult and it would have been much more difficult for live speakers to consistently encode synchrony and dissynchrony across encodings in similar and comparable ways. Second, videotape delivery allows a greater degree of control over extraneous experimental influences than does live delivery. This is particularly important when only certain nonverbal factors are to be manipulated while other factors, nonverbal and otherwise, are to be controlled. Therefore, because of the greater degree of precision and control provided by a videotape delivery, it was deemed appropriate for the present study.

The message was encoded in eight different experimental conditions, two of which were audiotaped. Two different speakers, who were male graduate students in the theatre department at the University of Florida and had a great deal of acting experience, were used to encode the message for video and audio taping. Major and minor points of emphasis, for example where phonemic clauses would occur, were identified in the message script. The speakers were trained to be aware of these emphasis points in the message and to either perform or not perform emphasizing, accentuating, and illustrating coverbal hand gestures, body and facial activity concomitant with the emphasis points. In the two synchronous (in-sync) encoding modes (condition 1 and condition 4), speakers were trained to deliver the message in a smooth, rhythmical style, coordinating their dynamic coverbal behaviors (hand gestures, head-facial activity, body movements) to the vocal stress patterns, and in particular, performing such coverbal cues at the identified emphasis points. Rate of presentation for both speakers averaged 161 wpm for normal rate (condition 1) and 179 wpm for fast rate (condition 4). These rates are within the range of conversational rate reported earlier (120-180 wpm).

Normal and fast rates for encoding were established by instructing both speakers to deliver the message at either normal or fast rates.

In the dissynchronous (out-sync) encoding conditions, speakers were trained to engage in coverbal activity not coordinated with their vocal rhythm. Such activity included moderate amounts of self-manipulative behavior and hand movements not coordinated to the vocal stress patterns. At indicated points of emphasis in the message, no emphasizing gestures or movements were performed; but these were performed immediately after the vocal emphasis points. Thus, dissynchrony here has been operationalized as coverbal movement not coordinated to the rhythm of speech, occurrence of self-manipulative behavior, or coverbal activity lagged or performed just after emphasis points in the message. Rate of presentation for this encoding mode for both speakers averaged 158 wpm for the normal condition (condition 2) and 182 wpm for the fast rate condition (condition 5).

In the no-sync encoding conditions, the presence of synchronized coverbal cues was minimized. Speakers were trained to deliver the message and not perform dynamic coverbal cues while keeping vocal characteristics constant and similar to other conditions. Therefore, these conditions constitute no-cues conditions. Rate of presentation for both speakers in this encoding mode averaged 155 wpm for normal rate (condition 3) and 181 wpm for fast rate (condition 6). The two other experimental contrast conditions consisted of the audio channel only of the message presented at both the normal rate (condition 7) and at a fast rate (condition 8). Rate of presentation for each condition by speaker may be found in Table 2.

The two speakers used in videotape production were similar in age, physical appearance, and dress. A pre-test equivalency check comparing

TABLE 2
WORD PER MINUTE FOR EACH CONDITION BY SPEAKER

Condition	Speaker	Word per Minute
1	1	168.54
1	2	153.28
		$\bar{X}_{12}$ wpm = 160.92
2	1	165.79
2	2	149.34
		$\bar{X}_{12}$ wpm = 157.56
3	1	161.20
3	2	148.25
		$\bar{X}_{12}$ wpm = 154.72
4	1	180.53
4	2	176.60
		$\bar{X}_{12}$ wpm = 178.57
5	1	182.81
5	2	180.53
		$\bar{X}_{12}$ wpm = 185.17
6	1	184.64
6	2	178.16
		$\bar{X}_{12}$ wpm = 181.40
7	1	161.20
7	2	153.30
		$\bar{X}_{12}$ wpm = 157.25
8	1	180.53
8	2	176.60
		$\bar{X}_{12}$ wpm = 178.56

the two speakers on the social, task and physical dimensions of attraction was performed. The pre-test subjects were 40 undergraduate students enrolled in a basic speech course at the University of Florida who were not used in the experimental phase of the study. Twenty of the pre-test subjects were exposed to a videotape still shot of one speaker, while the other twenty pre-test subjects were exposed to a videotape still shot of the other speaker. Pre-test subjects were asked to rate the speakers on attraction scales developed by McCroskey and McCain (1974). These scales measure attraction by a series of twelve Likert-type statements that reflect physical, social and task dimensions of attraction. The complete series of scales may be seen in Appendix B. A series of previous studies (Burgoon, Stacks, & Woodall, 1977) had found these scales to be moderately to very reliable measures of these attraction dimensions (reliability coefficients reported in those studies ranged from .67 to .87). Alpha coefficients indicating reliability (Cronbach, 1951) of the measures in the present study were social attraction (.63), task attraction (.70), and physical attraction (.74). Three t tests were performed comparing attraction scores for the two speakers and results indicated no significant differences between speakers on social, task, or physical attraction dimensions (social attraction $\underline{t} = .2239$, $df = 38$, $p < .82$; task attraction $\underline{t} = .208$, $df = 38$, $p < .84$; physical attraction $\underline{t} = 1.609$, $df = 38$, $p < .12$). Thus, the speakers used in the study were equivalent in terms of these attraction dimensions.

Technical aspects of videotape production, such as camera position and shots, lighting, and audio levels were held constant across recordings. Each message began with a fade-in shot on the speaker and an off-camera voice asking the following question: "What's your solution to solving the funding problems of universities?" Following the question, the speaker performed the message in the particular assigned encoding mode.

Videotaping facilities and assistance were provided at a campus television studio.

Finally, all videotaped messages were evaluated by a panel of three judges, two of whom were instructors in speech and the other an instructor in social psychology. All three judges have broad background and training in nonverbal communication and behavior, and were experienced in nonverbal research and videotape methodology. Each of the six videotaped encoding conditions was viewed by the judges on a videotape recorder and monitor. Each condition was evaluated for the presence of the manipulated nonverbal factors (synchronous coverbal activity, dis-synchronous coverbal activity, or no coverbal activity; normal or fast speaking rates). Additionally, the understandability of each condition, as well as the occurrence of any extraneous or uncontrolled cues which might have a biasing effect, was evaluated by the judges by viewing each of the conditions. The videotaped conditions were acceptable for experimental use only if, upon viewing, each judge indicated that a given condition met the following criteria: (1) the coverbal activity was synchronized (in the case of an in-sync condition) or unsynchronized (in the case of an out-sync condition) to the vocal rhythm, and that the amount of synchronized or unsynchronized coverbal activity was enough to make a clear difference between conditions. In the no-sync conditions, an absence of coverbal activity was the required criteria for experimental use. (2) The rates at which the encoding conditions were performed appeared to be normal or speeded up, as well as consistent across speakers, and that there be a noticeable difference between normal and fast speaking rates. (3) Each encoding condition was understandable and that there were no extraneous or uncontrolled cues in a given condition. Several

versions of encoding conditions were presented to the judges before all three agreed that each of the criteria had been met.

Dependent Measures

A packet of post-experimental measures was used to assess subjects' reactions to the message along several dimensions. Subjects' attitudes towards a 20% increase in undergraduate tuition was measured by four seven-interval semantic differential scales bounded by the bipolar adjective pairs: good-bad, foolish-wise, pleasant-unpleasant, and valuable-worthless. Reliability of the semantic differential attitude measure was computed using Cronbach's coefficient alpha (1951). The semantic differential measure was found to be highly reliable; the alpha coefficient was found to be .89. Attitudes were also measured by an eleven-interval scale with weighted known intervals (Burgoon & Burgoon, 1977). Each position on the known interval scale has an associated weight, those weights being: dislike intensely = .66, terrible = 2.49, very bad = 3.24, bad = 4.17, poor = 5.01, neutral = 6.00, fair = 6.99, good = 7.83, very good = 8.73, excellent = 9.51, like intensely = 11.21. These weights should more accurately reflect the value given to a position on the scale by a subject. A recent investigation (Stacks, 1978) found that the known interval scale was highly correlated with a semantic differential measure of attitudes ($r = .86$) similar to the semantic differential measure used in the present study. Similarly, in the present study the known interval measure was highly correlated with the semantic differential measure ($r = .86$).

Five dimensions of source credibility (competence, character, composure, extroversion and sociability) were measured by a series of seven-interval semantic differential type scales developed by McCroskey, Jensen, and Valencia (1973). A previous investigation (Burgoon, Stacks,

& Woodall, 1977) found these scales to be reliable measures of source credibility dimensions with alpha coefficients ranging from .72 to .77 for the five dimensions. The present investigation also found the source credibility measure to be reliable; alpha coefficients for each dimension were: competence (.81), composure (.81), extroversion (.82), character (.63), and sociability (.75). This measure was to provide manipulation checks for the perceptions of the speaker in the different message encoding conditions.

There were two measures of comprehension. The first included recall, assessed by having subjects list everything they could remember about the content of the message; recognition, assessed by a series of eight multiple-choice questions and twelve true-false questions on the details of the arguments given in the message. Subjects' recall scores were scored by two independent judges, both of whom were instructors in the speech communication department. There were four main arguments presented in the message, each with three subpoints. Judges were instructed to rate subjects' responses on a one-to-five scale for each main argument. Subjects' responses were rated based on the following criteria: 1 = no response concerning the argument; 2 = response indicates recall of one subpoint or main point of argument only; 3 = response indicates recall of two subpoints of argument or main point and one subpoint; 4 = response indicates recall of three subpoints of argument or main point and two subpoints; 5 = response indicates recall of all subpoints of argument and main point. Judges were provided with a list of each argument's main point and subpoints. Judges' ratings for each argument were summed to give an overall recall score. Reliability between the two judges for

this procedure was estimated by an intraclass correlation (Guilford, 1954). Reliability for the judges was found to be high ($r_I = .96$).

Subjects' recognition scores were computed by using a corrected formula for both multiple-choice and true-false questions (number right - $1/3$ of number wrong for the multiple-choice; number right - number wrong for the true-false). The corrected multiple-choice scores were weighted by three and summed with the corrected true-false scores for the final recognition score. A weighting of three was given to the multiple-choice scores because the multiple-choice questions dealt with the main points of the arguments while the true-false questions dealt with easily recognizable subpoints. Answering the multiple-choice questions correctly required subjects to integrate argument subpoints (of which there were three) and thus multiple-choice scores received a weight of three (Shaw, Note 1).

Extent to which subjects were distracted during message reception was measured by a series of seven-interval scales couended by the following adjective pairs: comfortable-uncomfortable; calm-anxious; distracted-not distracted; tense-relaxed; attentive-inattentive. A previous investigation (Stacks, 1978) had found these scales to be a reliable measure of receiver distraction (coefficient alpha = .78). The present investigation also found the scales to be reliable (coefficient alpha = .78).

Finally, counterarguing behavior was assessed by having subjects list what they thought during or immediately after the message. Two independent judges, both of whom were instructors in the speech communication department scored the subjects' responses as counterarguments if the response indicated a negative consequence of the position advocated, constituted

an attack on the validity of the message, or derogated the message source. Separate scores for message attacks and source derogating statements were kept and then summed for an overall counterargument score (as suggested by Miller & Baron, 1973). Reliability computed by intraclass correlations for judges' scoring on the message attack component of counterarguing was found to be high ($r_I = .87$) as was the reliability for the source derogation component ($r_I = .98$) and the overall counterarguing measure ($r_I = .89$). It should be noted here that several authors (Brandt et al., 1977; Miller & Baron, 1973) have discussed the problems associated with measuring counterargument. The present method of measuring counterarguing possibly has reactivity problems. In other words, when subjects are requested post-hoc to list what they thought during a message, it is not clear whether their responses indicate what they thought during the message, or whether their responses are generated as a result of the request. Given the problems associated with measuring counterargument, this dependent variable may not be very valid, but may possibly offer some support for the present formulation of relationships. Unfortunately, until a better measure of counterarguing is developed, questions about the importance of counterarguing and its relationship to other variables cannot be confidently answered.

The last page of the post-experimental packet contained a free-response question asking the subject's opinion of the experimental procedures, a yes-no question asking subjects if they knew the speaker, and a question asking whether the subject was suspicious, and if so, why. The recognition, recall, source credibility, attitude, distraction, and counterargument measures may be seen in Appendix C.

CHAPTER III

RESULTS

Test of Hypotheses

Hypothesis one predicted a main effect for synchrony on comprehension measures and that message comprehension would be significantly higher in synchronous message conditions than in dissynchronous message conditions. To test this hypothesis, multiple regression with dummy coding was used to compute a 2 (speaker 1 - speaker 2) x 2 (normal rate - fast rate) x 3 (in-sync - out-sync - no-sync) analysis of variance for unequal N on the videotape experimental treatment groups for both measures of comprehension (recall and recognition). A blocking effect was included in the analysis to detect differences between speakers on comprehension. The terms in the analysis which tested the predictions of hypothesis one on the recall measure were a main effect for synchrony and a planned t test between the synchronous and dissynchronous main effect means. A significant main effect for synchrony on recall was obtained in the analysis, $F(2, 166) = 5.76, p < .05$. As predicted, a planned t test between synchronous and dissynchronous main effect means (synchronous $\bar{X} = 9.08$; dissynchronous $\bar{X} = 7.63$) was found to be significant, $t(166) = 3.17, p < .05$. Thus, for the recall measure, hypothesis one received support. A power test for the synchrony main effect (Winer, 1971) indicated power to be high for the predicted main effect (power = .84).

A significant blocking effect for speaker was obtained in the recall analysis, $F(1, 166) = 7.17, p < .05$. Inspection of the main effect means

for speaker indicated that exposure to speaker two resulted in higher recall scores than speaker one (speaker two $\bar{X} = 9.09$; speaker one $\bar{X} = 8.05$). A summary of main effect and interaction means may be found in Table 3. No other significant effects were obtained in the recall analysis. A summary of the analysis of variance and planned t test means for recall may be seen in Table 4.

A similar $2 \times 2 \times 3$ analysis of variance for unequal N was computed on the recognition measure of comprehension to test hypothesis one. The analysis produced a nonsignificant main effect for synchrony, $F(2, 166) = .81$. A power analysis indicated a low level of power for this effect (.22). The planned t test between the synchronous and dissynchronous means (synchronous $\bar{X} = 28.85$; dissynchronous $\bar{X} = 27.54$) was also found to be nonsignificant, $t(166) = 1.22$. Thus, for the recognition measure, hypothesis one did not receive support. Overall then, hypothesis one was partially supported.

As in the recall analysis, a significant speaker blocking effect was obtained, $F(1, 166) = 4.17$, $p < .05$. The speaker main effect means indicated higher recognition scores for speaker two than for speaker one (speaker two $\bar{X} = 29.28$; speaker one $\bar{X} = 27.48$). No other significant effects were obtained in the recognition analysis. A summary of the analysis of variance and the means contrasted by the planned t test for recognition may be found in Table 5. Recognition main effect and interaction means are summarized in Table 6.

Hypothesis two which predicted that messages containing synchronized coverbal cues would result in significantly higher message comprehension than messages in which such cues are not performed failed to be supported. This hypothesis was tested by a planned comparison t test between the

TABLE 3

SUMMARY OF MAIN EFFECT AND INTERACTION MEANS FOR RECALL

Effect		<u>N</u>	$\bar{X}^*$ Recall
<u>Speaker</u>			
1		87	8.05
2		91	9.09
<u>Rate</u>			
Normal		91	8.70
Fast		87	8.47
<u>Synchrony</u>			
Synchronous		60	9.08
Dissynchronous		57	7.63
No-sync		61	9.00
<u>Rate x Synchrony</u>			
Normal	Synchronous	No-sync	Dissynchronous
	9.50	9.00	7.60
	<u>N</u> = 30	<u>N</u> = 31	<u>N</u> = 30
Fast	8.66	9.00	7.66
	<u>N</u> = 30	<u>N</u> = 30	<u>N</u> = 27
<u>Speaker x Rate</u>			
1	Normal	Fast	
	8.08	8.02	
	<u>N</u> = 45	<u>N</u> = 42	
2	9.30	8.83	
	<u>N</u> = 46	<u>N</u> = 45	
<u>Speaker x Synchrony</u>			
1	Synchronous	No-sync	Dissynchronous
	8.57	8.63	6.96
	<u>N</u> = 28	<u>N</u> = 30	<u>N</u> = 29
2	9.53	9.35	8.32
	<u>N</u> = 32	<u>N</u> = 31	<u>N</u> = 28
<u>Speaker x Rate x Synchrony</u>			
Normal	Speaker 1		
	Synchronous	No-sync	Dissynchronous
	9.14	8.80	6.50
	<u>N</u> = 14	<u>N</u> = 15	<u>N</u> = 16
Fast	8.00	8.46	7.53
	<u>N</u> = 14	<u>N</u> = 15	<u>N</u> = 13
Normal	Speaker 2		
	Synchronous	No-sync	Dissynchronous
	9.81	9.18	8.85
	<u>N</u> = 16	<u>N</u> = 16	<u>N</u> = 14
Fast	9.25	9.53	7.78
	<u>N</u> = 16	<u>N</u> = 15	<u>N</u> = 14

*Scores may range from 4 (low recall) to 20 (high recall).

TABLE 4
ANOVA SUMMARY AND CONTRASTED MEANS FOR RECALL

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	43.9798	1	43.97	7.17*
Rate	3.6651	1	3.66	.60
Synchrony	70.7441	2	35.37	5.76*
Rate x Synchrony	7.1254	2	3.56	.58
Speaker x Rate	.8898	1	.88	.14
Speaker x Synchrony	2.4480	2	1.22	.20
Speaker x Rate x Synchrony	18.1172	2	9.05	1.48
Error	1018.7581	166	6.13	

* $p < .05$

-Contrasted Means-

Effect	<u>N</u>	$\bar{X}$ Recall
Synchronous	60	9.08
Dissynchronous	57	7.63
No-sync	61	9.00

TABLE 5
ANOVA SUMMARY AND CONTRASTED MEANS FOR RECOGNITION

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	139.0553	1	139.05	4.17*
Rate	8.9817	1	8.98	.27
Synchrony	53.7937	2	26.89	.81
Rate x Synchrony	27.9542	2	13.97	.42
Speaker x Rate	1.4114	1	1.41	.04
Speaker x Synchrony	36.4807	2	18.40	.55
Speaker x Rate x Synchrony	20.9811	2	10.49	.31
Error	5541.0790	166	33.37	

* $p < .05$

-Contrasted Means-

Effect	N	$\bar{X}$ Recognition
Synchronous	60	28.85
Dissynchronous	57	27.54
No-sync	61	28.77

TABLE 6

SUMMARY OF MAIN EFFECT AND INTERACTION MEANS FOR RECOGNITION

Effect		<u>N</u>	$\bar{X}$ Recognition*
<u>Speaker</u>			
1		87	27.48
2		91	29.28
<u>Rate</u>			
Normal		91	28.59
Fast		87	28.20
<u>Synchrony</u>			
Synchronous		60	28.85
Dissynchronous		57	27.54
No-sync		61	28.77
<u>Rate x Synchrony</u>			
Normal	Synchronous	No-sync	Dissynchronous
	29.60 <u>N</u> = 30	28.58 <u>N</u> = 31	27.60 <u>N</u> = 30
Fast	28.10 <u>N</u> = 30	28.96 <u>N</u> = 30	27.48 <u>N</u> = 27
<u>Speaker x Rate</u>			
1	Normal 27.57 <u>N</u> = 45	Fast 27.38 <u>N</u> = 42	
2	29.58 <u>N</u> = 46	28.97 <u>N</u> = 45	
<u>Speaker x Synchrony</u>			
1	Synchronous 27.35 <u>N</u> = 28	No-sync 28.46 <u>N</u> = 30	Dissynchronous 26.58 <u>N</u> = 29
2	30.15 <u>N</u> = 32	29.06 <u>N</u> = 31	28.53 <u>N</u> = 28
<u>Speaker x Rate x Synchrony</u>			
Normal	Synchronous	Speaker 1 No-sync	Dissynchronous
	28.14 <u>N</u> = 14	28.53 <u>N</u> = 15	26.18 <u>N</u> = 16

TABLE 6 - Continued

Fast	26.57 <u>N</u> = 14	28.40 <u>N</u> = 15	27.07 <u>N</u> = 13
	Synchronous	Speaker 2 No-sync	Dissynchronous
Normal	30.87 <u>N</u> = 16	28.62 <u>N</u> = 16	29.21 <u>N</u> = 14
Fast	29.43 <u>N</u> = 16	29.53 <u>N</u> = 15	27.85 <u>N</u> = 14

and recognition. For the recall measure, results of the planned t test between the in-sync mean (9.08) and the no-sync mean (9.00) were nonsignificant, $t(166) = .18$. For the recognition measure, results of the planned comparison between the in-sync mean (28.85) and the no-sync mean (28.77) were also nonsignificant, $t(166) = .076$. A summary of the analyses for recall and recognition may be found in Tables 4 and 5, respectively.

Hypothesis three predicted that messages containing synchronized coverbal cues would result in significantly higher receiver comprehension than similar messages presented only on the audio channel. Multiple regression with dummy coding was used to compute a 2 (speaker 1 - speaker 2) $\times$ 2 (normal rate - fast rate) $\times$ 2 (audio and visual channels - audio channel only) analysis of variance for unequal N on all experimental treatment groups for the recall and recognition measures of comprehension. The number of subjects in the audio-visual conditions was much larger than the number of subjects in the audio only conditions (178 vs. 67). Thus, the channel main effect was nonorthogonal. Therefore, this hypothesis was tested by a planned orthogonal comparison for unequal N s as suggested by Kerlinger and Pedhazur (1973, p. 145). A vector was created which contrasted the average synchronous message mean across normal and fast rates (conditions 1 and 4) with the average mean of the audio channel conditions across rates (conditions 7 and 8). The vector was then included in the regression analysis as an effect for both recall and recognition. The t ratio for the regression coefficient associated with the contrast effect was the test of significance for the contrast. Results of the analysis on recall indicated nonsignificance for the contrast, $t(237) = .63$. Power for this contrast was shown to be low

(.10). Results for the comparison on recognition also indicated non-significance, $t(237) = 1.01$. Power for this contrast was also low (.16). Thus, hypothesis three was not supported. A summary of these analyses and the contrasted means may be found in Table 7.

Other unhypothesized effects found to be significant in this analysis were speaker blocking effects for both recall and recognition; for recall, $F(1, 237) = 5.41$, $p < .05$; for recognition, $F(1, 237) = 4.90$, $p < .05$. Additionally, a main effect for rate was found to be significant for the recognition measure, $F(1, 237) = 4.57$, $p < .05$. The pattern of means for these effects suggested that speaker two messages resulted in greater comprehension than speaker one messages and that receivers comprehended more of the message at normal rates than at fast rates (speaker 1 recall $\bar{X} = 8.17$, speaker 2 recall $\bar{X} = 9.08$; speaker 1 recognition $\bar{X} = 27.30$, speaker 2 recognition $\bar{X} = 29.16$; normal rate $\bar{X} = 28.86$, fast rate $\bar{X} = 27.64$). However, given that disparity in cell sizes are large for this analysis, such effects should be interpreted cautiously.

Hypothesis four predicted an ordinal interaction between rate of presentation and synchrony on attitudes such that subjects would be significantly more persuaded by a synchronous fast rate message than by a synchronous normal rate message or a dissynchronous message at either normal or fast rates. This hypothesis was tested by using multiple regression with dummy coding to compute a 2×3 analysis of variance for unequal N on the semantic differential measure of attitudes. The blocking effect for speakers was dropped from the final analysis on the semantic differential scores as a result of the F value being less than one in an initial analysis. A similar $2 \times 2 \times 3$ analysis of variance for unequal N was computed on the known interval measure of attitudes, the speaker blocking effect being retained in this analysis.

TABLE 7

SUMMARY OF ANOVA AND PLANNED COMPARISON RESULTS
FOR TEST OF HYPOTHESIS THREE

-Recall-

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	33.4292	1	33.42	5.41*
Rate	2.3200	1	2.32	.38
Channel	2.2221	1	2.22	.36
Rate x Channel	.0219	1	.02	.0035
Speaker x Rate	6.0540	1	6.05	.98
Speaker x Channel	2.1169	1	2.11	.34
Speaker x Rate x Channel	1.5419	1	1.54	.25
Error	1465.5416	237	6.18	

* $p < .05$

-Contrasted Means-

Condition	N	$\bar{X}$ Recall
1 - Normal rate, synchronous	30	9.50*
2 - Normal rate, dissynchronous	30	7.60
3 - Normal rate, no-cues	31	9.00
4 - Fast rate, synchronous	30	8.66*
5 - Fast rate, dissynchronous	27	7.66
6 - Fast rate, no-cues	30	9.00
7 - Normal rate, audio only	31	8.87*
8 - Fast rate, audio only	36	8.69*

*Comparison contrasted average of conditions 1 and 4 with average of conditions 7 and 8.

TABLE 7 - Continued

- Recognition -

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	193.6289	1	193.62	4.90*
Rate	180.3015	1	180.30	4.57*
Channel	8.5358	1	8.53	.22
Rate x Channel	112.8715	1	112.87	2.86
Speaker x Rate	7.0402	1	7.04	.18
Speaker x Channel	1.8830	1	1.88	.05
Speaker x Rate x Channel	1.4860	1	1.48	.04
Error	9360.4483	237	39.49	

*p < .05

-Contrasted Means-

Condition	N	$\bar{X}$ Recognition
1 - Normal rate, synchronous	30	29.60*
2 - Normal rate, dissynchronous	30	27.60
3 - Normal rate, no-sync	31	28.58
4 - Fast rate, synchronous	30	28.10*
5 - Fast rate, dissynchronous	27	27.48
6 - Fast rate, no-sync	30	28.96
7 - Normal rate, audio only	31	29.64*
8 - Fast rate, audio only	36	26.27*

*Comparison contrasted average of conditions 1 and 4 with average of conditions 7 and 8.

The term in the analysis which tested hypothesis four was the interaction term between rate and synchrony. For the semantic differential analysis, the rate x synchrony interaction term was nonsignificant, $F(2, 172) = .05$. A power test for the interaction effect indicated a low level of power (.06). For the known interval attitude measure, the rate x synchrony interaction term was also nonsignificant, $F(2, 166) = .55$. Power for this effect was also found to be low (.10). Due to the nonsignificant interaction effects, comparisons between the interaction means were not performed. Thus, hypothesis four did not receive support. A summary of main effect and interaction means for the semantic differential and known interval measures is presented in Table 8.

Other unhypothesized significant effects were obtained in these analyses. A main effect for synchrony on the known interval measure, $F(2, 166) = 3.07$, $p < .05$, was obtained in the analyses. A near significant trend for a synchrony main effect, $F(2, 172) = 2.93$, $p < .06$, was obtained in the semantic differential analysis. Inspection of the main effect means for both measures suggested that synchronous messages were more persuasive than dissynchronous messages (synchronous $\bar{X}$ for semantic differential = 15.51; dissynchronous $\bar{X}$ for semantic differential = 13.22; synchronous $\bar{X}$ for known interval = 5.88; dissynchronous $\bar{X}$ for known interval = 4.92). Differences between synchronous means and no-cues or no-sync means may also have contributed to the overall main effect (synchronous $\bar{X}$ for semantic differential = 15.51; no-sync $\bar{X}$ for semantic differential = 13.91; synchronous $\bar{X}$ for known interval = 5.88; no-sync $\bar{X}$ for known interval = 5.34). The pattern of main effect means across the synchronous, no-sync and dissynchronous cells suggests a linear trend across these three cells (synchronous to no-sync to dissynchronous

TABLE 8

SUMMARY OF MEANS FOR SEMANTIC DIFFERENTIAL AND
KNOWN INTERVAL ATTITUDE MEASURES

Effect	<u>N</u>	$\bar{X}^*$ Semantic Differential	
<u>Rate</u>			
Normal	91	14.48	
Fast	87	13.97	
<u>Synchrony</u>			
Synchronous	60	15.51	
Dissynchronous	57	13.22	
No-sync	61	13.91	
<u>Rate x Synchrony</u>			
Normal	Synchronous 15.96 <u>N</u> = 30	No-sync 14.06 <u>N</u> = 31	Dissynchronous 13.43 <u>N</u> = 30
Fast	15.06 <u>N</u> = 30	13.76 <u>N</u> = 30	13.00 <u>N</u> = 27
Effect	<u>N</u>	$\bar{X}^{**}$ Known Interval	
<u>Speaker</u>			
1	87	5.56	
2	91	5.22	
<u>Rate</u>			
Normal	91	5.49	
Fast	87	5.28	
<u>Synchrony</u>			
Synchronous	60	5.88	
Dissynchronous	57	4.92	
No-sync	61	5.34	
<u>Rate x Synchrony</u>			
Normal	Synchronous 6.21 <u>N</u> = 30	No-sync 5.36 <u>N</u> = 31	Dissynchronous 4.90 <u>N</u> = 30
Fast	5.55 <u>N</u> = 30	5.32 <u>N</u> = 30	4.94 <u>N</u> = 27

TABLE 8 - Continued

Speaker x Rate

	Normal	Fast
1	5.85 <u>N</u> = 45	5.24 <u>N</u> = 42
2	5.13 <u>N</u> = 46	5.31 <u>N</u> = 45

Speaker x Synchrony

	Synchronous	No-sync	Dissynchronous
1	6.22 <u>N</u> = 28	5.62 <u>N</u> = 30	4.85 <u>N</u> = 29
2	5.59 <u>N</u> = 32	5.07 <u>N</u> = 31	4.98 <u>N</u> = 28

Speaker x Rate x Synchrony

	Synchronous	Speaker 1	Dissynchronous
		No-sync	
Normal	7.10 <u>N</u> = 14	5.54 <u>N</u> = 15	5.04 <u>N</u> = 16
Fast	5.35 <u>N</u> = 14	5.70 <u>N</u> = 15	4.61 <u>N</u> = 13
	Synchronous	Speaker 2	Dissynchronous
		No-sync	
Normal	5.44 <u>N</u> = 16	5.19 <u>N</u> = 16	4.72 <u>N</u> = 14
Fast	5.73 <u>N</u> = 16	4.93 <u>N</u> = 15	5.24 <u>N</u> = 14

*Scores may range from 4 to 28.

**Scores may range from .66 to 11.21.

TABLE 9
ANOVA SUMMARY FOR ATTITUDE MEASURES

-Semantic Differential-

Source	Sum of Squares	d.f.	Mean Squares	F
Rate	13.1312	1	13.13	.47
Synchrony	163.7260	2	81.86	2.93**
Rate x Synchrony	2.9938	2	1.49	.05
Error	4811.4376	172	27.97	

**Trend, $p < .06$.

-Known Interval-

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	5.2759	1	5.27	1.11
Rate	2.6486	1	2.64	.56
Synchrony	29.2408	2	14.62	3.07*
Rate x Synchrony	5.2198	2	2.60	.55
Speaker x Rate	8.1752	1	8.17	1.71
Speaker x Synchrony	5.5150	2	2.75	.58
Speaker x Rate x Synchrony	11.5609	2	5.78	1.21
Error	791.7762	166	4.76	

* $p < .05$

Hypothesis five predicted an ordinal interaction between rate and synchrony on distraction. This specified that subjects would be highly distracted by dissynchronous messages regardless of rate of presentation and that subjects would be moderately distracted by fast rate synchronous messages while subjects receiving synchronous normal rate messages would not be distracted. This hypothesis was tested by using multiple regression with dummy coding to compute a $2 \times 2 \times 3$ analysis of variance for unequal N on the distraction measure. The term in the analysis which tested the hypothesis was the rate $\times$ synchrony interaction term. The rate $\times$ synchrony interaction effect in this analysis was not significant, $F(2, 166) = .55$. The level of power for this effect proved to be low (.10). Thus, hypothesis five was not supported. A summary of the means in the analysis is provided in Table 10.

Other, unpredicted significant effects were obtained in the analysis. A significant synchrony main effect on distraction was obtained, $F(2, 166) = 6.44$, $p < .05$. The pattern of main effect means suggested that dissynchronous messages were more distracting than the synchronous or the no-sync messages (dissynchronous $\bar{X} = 19.40$; synchronous $\bar{X} = 15.68$; no-sync mean = 16.14). A significant main effect for rate on distraction was also obtained in the analysis, $F(1, 166) = 7.85$, $p < .05$. Inspection of the main effect means for rate suggested fast rate to be more distracting than normal rate (normal rate $\bar{X} = 15.81$; fast rate $\bar{X} = 18.31$). Another significant term obtained in the analysis was the speaker blocking effect, $F(1, 166) = 6.63$, $p < .05$. The main effect means for speaker suggested that speaker one was more distracting than speaker two (speaker 1 distraction $\bar{X} = 18.29$; speaker 2 distraction $\bar{X} = 15.82$). Finally, a near significant trend for a speaker $\times$ synchrony interaction term was also obtained in the analysis,

TABLE 10
SUMMARY OF MEANS FOR THE DISTRACTION MEASURE

Effect	<u>N</u>	$\bar{X}^*$ Distraction
<u>Speaker</u>		
1	87	18.29
2	91	15.82
<u>Rate</u>		
Normal	91	15.81
Fast	87	18.31
<u>Synchrony</u>		
Synchronous	60	15.68
Dissynchronous	57	19.40
No-sync	61	16.14
<u>Rate x Synchrony</u>		
Normal	Synchronous	No-sync
	14.40	14.29
	<u>N</u> = 30	<u>N</u> = 31
Fast	Synchronous	Dissynchronous
	16.96	18.80
	<u>N</u> = 30	<u>N</u> = 30
		20.07
		<u>N</u> = 27
<u>Speaker x Rate</u>		
1	Normal	Fast
	17.73	18.90
	<u>N</u> = 45	<u>N</u> = 42
2	Normal	Fast
	13.93	17.75
	<u>N</u> = 46	<u>N</u> = 45
<u>Speaker x Synchrony</u>		
1	Synchronous	No-sync
	15.89	18.90
	<u>N</u> = 28	<u>N</u> = 30
2	Synchronous	Dissynchronous
	15.50	20.00
	<u>N</u> = 32	<u>N</u> = 29
		18.78
		<u>N</u> = 28
<u>Speaker x Rate x Synchrony</u>		
Normal	Synchronous	Speaker 1
	15.07	No-sync
	<u>N</u> = 14	17.66
		<u>N</u> = 15
		Dissynchronous
		20.12
		<u>N</u> = 16

TABLE 10 - Continued

Fast	16.71 <u>N</u> = 14	20.13 <u>N</u> = 15	19.84 <u>N</u> = 13
	Speaker 2		
Normal	Synchronous 13.81 <u>N</u> = 16	No-sync 11.12 <u>N</u> = 16	Dissynchronous 17.28 <u>N</u> = 14
Fast	17.18 <u>N</u> = 16	16.00 <u>N</u> = 15	20.28 <u>N</u> = 14

*Scores may range from 5 to 35.

$F(2, 166) = 2.97, p < .06$. The pattern of the speaker x synchrony means suggested that although the distractive effects of the two speakers were equivalent in the synchronous conditions (speaker 1 in-sync $\bar{X} = 15.89$; speaker 2 in-sync $\bar{X} = 15.50$), speaker one was more distracting than speaker two in the dissynchronous and no-sync conditions (speaker 1 dissynchronous $\bar{X} = 20.00$; speaker 2 dissynchronous $\bar{X} = 18.78$; speaker 1 no-sync $\bar{X} = 18.90$; speaker 2 no-sync $\bar{X} = 13.48$). A summary of the results for this analysis is provided in Table 11.

Hypothesis six was concerned with the effects of synchrony and rate of presentation on counterargument. This hypothesis predicted an interaction between vocal rate and synchrony on counterarguing such that subjects receiving synchronous fast rate messages would engage in significantly less counterarguing than subjects receiving synchronous normal rate or dissynchronous messages, regardless of rate. This hypothesis was tested by using a multiple regression with dummy coding to compute a $2 \times 2 \times 3$ analysis of variance for unequal N on the counterarguing measures. As indicated earlier, the message attack and the source derogation components of counterarguing would be analyzed, as well as the overall counterarguing scores. Results for each counterarguing component, as well as the overall measure are reported here. The term in the analysis which provided a test of hypothesis six was the rate x synchrony interaction term. The interaction effect between rate and synchrony proved nonsignificant for all three counterarguing measures; for message attack, $F(2, 166) = .74$; for source derogation, $F(2, 166) = .29$; for counterarguing, $F(2, 166) = .80$. Power for all three of these effects was very low; power for message attack = .11;

TABLE II
ANOVA SUMMARY FOR DISTRACTION

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	236.4053	1	236.40	6.63*
Rate	279.8626	1	279.86	7.85*
Synchrony	459.4952	2	229.74	6.44*
Rate x Synchrony	39.2120	2	19.60	.55
Speaker x Rate	67.7378	1	67.73	1.90
Speaker x Synchrony	211.9478	2	105.97	2.97**
Speaker x Rate x Synchrony	4.3633	2	2.18	.06
Error	5918.6339	166	35.65	

* $p < .05$

**Trend, $p < .06$

source derogation power = .09; power for counterarguing = .12. Thus, hypothesis six did not receive support. A summary of means for all three counterarguing measures, as well as the analysis of variance results for the three measures, may be found in Tables 12, 13, and 14.

The analysis yielded a number of other unpredicted significant effects. Significant blocking effects for speakers were obtained in both the message attack and source derogation analysis; for message attack, $F(1, 166) = 9.13$, $p < .05$; for source derogation, $F(1, 166) = 8.60$, $p < .05$. Inspection of the speaker main effect means suggested that subjects engaged in more message attack counterarguing when the message was delivered by speaker two than by speaker one (speaker 2 $\bar{X} = .49$; speaker 1 $\bar{X} = .20$) and that subjects engaged in more source derogation counterarguing when the message was delivered by speaker one than by speaker two (speaker 1 $\bar{X} = 1.27$; speaker 2 $\bar{X} = .75$). Additionally, synchrony main effects were obtained for both the source derogation and overall counterarguing measures, for source derogation, $F(2, 166) = 8.39$, $p < .05$; for counterarguing, $F(2, 166) = 4.79$, $p < .05$. The pattern of synchrony means for both source derogation and overall counterarguing suggested that dissynchronous conditions produced more counterarguing behavior by subjects than did the synchronous or no-sync conditions (dissynchronous source derogation $\bar{X} = 1.52$; synchronous source derogation $\bar{X} = .76$; no-sync source derogation $\bar{X} = .77$; dissynchronous counterarguing $\bar{X} = 1.80$; synchronous counterarguing $\bar{X} = 1.13$; no-sync counterarguing $\bar{X} = 1.18$). The reader may refer to Tables 12, 13, and 14 for a summary of means and results.

Hypothesis seven predicted significantly greater attitude yielding for synchronous fast rate messages than for fast rate messages in which

TABLE 12
SUMMARY OF MEANS FOR COUNTERARGUING MEASURES

Effect	<u>N</u>	<u>X</u> Message Attack	
<u>Speaker</u>			
1	87	.21	
2	91	.49	
<u>Rate</u>			
Normal	91	.34	
Fast	87	.36	
<u>Synchrony</u>			
Synchronous	60	.36	
Dissynchronous	57	.28	
No-sync	61	.40	
<u>Rate x Synchrony</u>			
Normal	Synchronous	No-sync	Dissynchronous
	.40 <u>N</u> = 30	.32 <u>N</u> = 31	.30 <u>N</u> = 30
Fast	.33 <u>N</u> = 30	.50 <u>N</u> = 30	.26 <u>N</u> = 27
<u>Speaker x Rate</u>			
1	Normal	Fast	
	.17 <u>N</u> = 45	.23 <u>N</u> = 42	
2	.50 <u>N</u> = 46	.48 <u>N</u> = 45	
<u>Speaker x Synchrony</u>			
1	Synchronous	No-sync	Dissynchronous
	.17 <u>N</u> = 28	.10 <u>N</u> = 29	.33 <u>N</u> = 30
2	.53 <u>N</u> = 32	.48 <u>N</u> = 31	.46 <u>N</u> = 28
<u>Speaker x Rate x Synchrony</u>			
Normal	Synchronous	Speaker 1 No-sync	Dissynchronous
	.21 <u>N</u> = 14	.20 <u>N</u> = 15	.12 <u>N</u> = 16
Fast	.14 <u>N</u> = 14	.46 <u>N</u> = 15	.07 <u>N</u> = 13

TABLE 12 - Continued

	Synchronous	Speaker 2 No-sync	Dissynchronous
Normal	.56 <u>N</u> = 16	.43 <u>N</u> = 16	.50 <u>N</u> = 14
Fast	.50 <u>N</u> = 16	.53 <u>N</u> = 15	.42 <u>N</u> = 14

Effect	<u>N</u>	$\bar{X}$ Source Derogation
--------	----------	-----------------------------

<u>Speaker</u>		
1	87	1.27
2	91	.75

<u>Rate</u>		
Normal	91	1.02
Fast	87	1.00

<u>Synchrony</u>		
Synchronous	60	.76
Dissynchronous	57	1.52
No-sync	61	.77

<u>Rate x Synchrony</u>			
Normal	Synchronous	No-sync	Dissynchronous
	.80 <u>N</u> = 30	.67 <u>N</u> = 31	1.60 <u>N</u> = 30
Fast	.73 <u>N</u> = 30	.86 <u>N</u> = 30	1.44 <u>N</u> = 27

<u>Speaker x Rate</u>		
1	Normal 1.33 <u>N</u> = 45	Fast 1.21 <u>N</u> = 42
2	.72 <u>N</u> = 46	.80 <u>N</u> = 45

<u>Speaker x Synchrony</u>			
1	Synchronous	No-sync	Dissynchronous
	.78 <u>N</u> = 28	1.16 <u>N</u> = 30	1.86 <u>N</u> = 29
	.75 <u>N</u> = 32	.38 <u>N</u> = 31	1.17 <u>N</u> = 28

TABLE 12 - Continued

2	.75 N = 32	.38 N = 31	1.17 N = 28
<u>Speaker x Rate x Synchrony</u>			
	Synchronous	Speaker 1 No-sync	Dissynchronous
Normal	.71 N = 14	1.00 N = 15	2.18 N = 16
Fast	.85 N = 14	1.33 N = 15	1.46 N = 13
	Synchronous	Speaker 2 No-sync	Dissynchronous
Normal	.87 N = 16	.37 N = 16	.92 N = 14
Fast	.62 N = 16	.40 N = 15	1.42 N = 14
Effect	N	$\bar{X}$ Counterarguing	
<u>Speaker</u>			
1	87	1.48	
2	91	1.25	
<u>Rate</u>			
Normal	91	1.36	
Fast	87	1.36	
<u>Synchrony</u>			
Synchronous	60	1.13	
Dissynchronous	57	1.80	
No-sync	61	1.18	
<u>Rate x Synchrony</u>			
	Synchronous	No-sync	Dissynchronous
Normal	1.20 N = 30	1.00 N = 31	1.90 N = 30
Fast	1.06 N = 30	1.36 N = 30	1.70 N = 27
<u>Speaker x Rate</u>			
	Normal	Fast	
1	1.51 N = 45	1.45 N = 42	
2	1.22 N = 46	1.28 N = 45	

TABLE 12 - Continued

<u>Speaker x Synchrony</u>			
1	Synchronous	No-sync	Dissynchronous
	.96 <u>N</u> = 28	1.50 <u>N</u> = 30	1.96 <u>N</u> = 29
2	1.28 <u>N</u> = 32	.87 <u>N</u> = 31	1.64 <u>N</u> = 28
<u>Speaker x Rate x Synchrony</u>			
Normal	Synchronous	Speaker 1 No-sync	Dissynchronous
	.92 <u>N</u> = 14	1.20 <u>N</u> = 15	2.31 <u>N</u> = 16
Fast	1.00 <u>N</u> = 14	1.80 <u>N</u> = 15	1.53 <u>N</u> = 13
Normal	Synchronous	Speaker 2 No-sync	Dissynchronous
	1.43 <u>N</u> = 16	.81 <u>N</u> = 16	1.42 <u>N</u> = 14
Fast	1.12 <u>N</u> = 16	.93 <u>N</u> = 15	1.85 <u>N</u> = 14

TABLE 13

ANOVA SUMMARY FOR COMPONENTS OF COUNTERARGUING

-Message Attack-

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	3.7092	1	3.79	9.13*
Rate	.0146	1	.0146	.04
Synchrony	.4735	2	.2367	.58
Rate x Synchrony	.5992	2	.2996	.74
Speaker x Rate	.0422	1	.04	.10
Speaker x Synchrony	.4243	2	.2121	.52
Speaker x Rate x Synchrony	.0691	2	.0345	.09
Error	67.4147	166	.4061	

* $p < .05$

-Source Derogation-

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	10.5041	1	10.50	8.60*
Rate	.00078	1	.00078	.00064
Synchrony	20.50	2	10.25	8.39*
Rate x Synchrony	.7104	2	.3552	.29
Speaker x Rate	.3388	1	.33	.28
Speaker x Synchrony	4.7000	1	2.35	1.92
Speaker x Rate x Synchrony	6.001	2	3.00	2.46
Error	202.7801	166	1.22	

* $p < .05$

TABLE 14
ANOVA SUMMARY FOR OVERALL COUNTERARGUING MEASURE

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	1.7294	1	1.72	1.08
Rate	.0221	1	.02	.01
Synchrony	15.3926	2	7.66	4.79*
Rate x Synchrony	2.5842	2	1.29	.80
Speaker x Rate	.1418	1	.14	.09
Speaker x Synchrony	6.8670	2	3.43	2.14
Speaker x Rate x Synchrony	6.4579	2	3.22	2.01
Error	266.5980	166	1.60	

* $p < .05$

synchronized coverbal cues are not performed (fast rate, no-sync). This hypothesis was tested by a planned comparison t test between the synchronous fast rate mean (condition 4) and the no-sync fast rate mean (condition 6). Results of the t test for the semantic differential measure of attitudes between the in-sync mean (15.06) and the no-sync mean (13.76) proved nonsignificant, t (172) = .95. For the known interval measure, results of the planned comparison between the in-sync mean (5.55) and the no-sync mean (5.32) were nonsignificant, t (166) = .40. Thus, hypothesis seven was not supported. A summary of the contrasted means may be found in Table 8.

Hypothesis eight predicted significantly higher attitude yielding for fast rate synchronous messages presented on audio and visual channels than fast rate messages presented only on the audio channel. Multiple regression with dummy coding was used to compute a 2 (speaker 1 - speaker 2) $\times$ 2 (normal rate - fast rate) $\times$ 2 (audio visual channels - audio channel) analysis of variance for unequal N s on all experimental treatment groups for both measures of attitude. This hypothesis was tested by a planned orthogonal comparison for unequal N s as suggested by Kerlinger and Pedhazur (1973). A vector was created to contrast the mean for fast rate synchronous messages (condition 4) with the mean for fast rate messages presented on the audio channel only (condition 8). The vector was then included in the regression analysis as an effect for both the known interval and semantic differential measures of attitude. The t ratio for the regression coefficient associated with the contrast effect was the test of significance for the contrast. Results of the analysis on the semantic differential measure were nonsignificant, t (237) = .75. Power for this contrast was low (.12). Results of the

analysis for the known interval measure were also nonsignificant, $t(237) = .86$. Power for this contrast was also low (.13). Thus, hypothesis eight failed to receive support. A summary of the results and contrasted means may be found in Table 15.

Supplemental Analysis

Source credibility analyses. Measures of the five dimensions of source credibility were included in the experiment as manipulation checks for perception of the source in different encoding conditions, as well as to take account of the alternative credibility bolstering explanation. Multiple regression with dummy coding was used to compute a $2 \times 2 \times 3$ analysis of variance for unequal N on the videotaped encoding conditions for all five source credibility dimensions. Results for the competence dimension revealed a main effect for synchrony, $F(2, 166) = 11.82$, $p < .05$. Inspection of the synchrony main effect means suggested higher competence ratings for synchronous and no-sync conditions (synchronous $\bar{X} = 20.81$; no-sync $\bar{X} = 21.27$) than for dissynchronous conditions (dissynchronous $\bar{X} = 17.75$).

The composure dimension results indicated a significant main effect for synchrony, $F(2, 166) = 8.86$, $p < .05$. The pattern of synchrony main effect means for composure suggested that speakers were evaluated as more composed in the synchronous and no-sync conditions (synchronous $\bar{X} = 16.48$; no-sync $\bar{X} = 15.27$) than in the dissynchronous conditions (dissynchronous $\bar{X} = 12.61$).

Results for the extroversion dimension obtained a significant main effect for rate, $F(1, 166) = 50.27$, $p < .05$; a significant main effect for synchrony, $F(2, 166) = 8.81$, $p < .05$; a significant rate $\times$ synchrony interaction, $F(2, 166) = 4.67$, $p < .05$; and a significant speaker $\times$ rate

TABLE 15

SUMMARY OF ANOVA AND CONTRASTED MEANS FOR HYPOTHESIS EIGHT

-Semantic Differential-

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	.7765	1	.77	.03
Rate	.1045	1	.10	.0035
Channel	11.5601	1	11.56	.39
Rate x Channel	10.8010	1	10.80	.36
Speaker x Rate	5.7028	1	5.70	.19
Speaker x Channel	16.5925	1	16.59	.56
Speaker x Rate x Channel	9.3435	1	9.34	.31
Error	7079.5879	237	29.87	

-Known Interval-

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	.1027	1	.10	.02
Rate	.9461	1	.94	.19
Channel	4.0750	1	4.07	.82
Rate x Channel	.2507	1	.25	.05
Speaker x Rate	3.2636	1	3.26	.66
Speaker x Channel	6.5315	1	6.53	1.31
Speaker x Rate x Channel	.8304	1	.83	.17
Error	1178.2923	237	4.9716	

-Contrasted Means-

Condition	N	$\bar{X}$ Semantic Differential	$\bar{X}$ Known Interval
1 Normal rate, synchronous	30	15.96	6.21
2 Normal rate, dissynchronous	30	13.43	4.90
3 Normal rate, no-cues	31	14.06	5.36
4 Fast rate, synchronous	30	15.06*	5.55*
5 Fast rate, dissynchronous	27	13.00	4.94
6 Fast rate, no-cues	30	13.76	5.32
7 Normal rate, audio only	31	13.51	5.12
8 Normal rate, audio only	36	13.97*	5.08*

*Comparison contrasted mean of condition 4 with mean of condition 8.

interaction, $F(1, 166) = 4.75$, $p < .05$. Given that the interaction effects override the main effects, the pattern of the means for the rate x synchrony interaction (see Table 16) suggested that for normal rates, synchronous messages are rated as most extroverted, followed by no-sync messages and then by dissynchronous messages. At fast rates, however, synchronous messages are seen as most extroverted, followed by dissynchronous messages and then no-sync messages. Thus, the order of the last two cells at normal rates is reversed at fast rates for extroversion. The pattern of the speaker by rate interaction means suggested that speaker one was perceived as less extroverted than speaker two at normal rate, and more extroverted than speaker two at fast rate, thus producing a crossover interaction.

Results for the character dimension revealed a significant main effect for synchrony, $F(2, 166) = 4.43$, $p < .05$; a significant speaker x synchrony interaction, $F(2, 166) = 3.86$, $p < .05$; and a significant three-way interaction between speaker, rate, and synchrony, $F(2, 166) = 3.64$, $p < .05$. The pattern of means for the three-way interaction (see Table 16) suggested that for speaker two, character ratings were highest in the synchronous and no-sync conditions at both normal and fast rates. Character ratings for speaker one were highest in the synchronous condition, moderate in the dissynchronous condition, and lowest in the no-sync condition at normal vocal rate. However, at fast rate this order was reversed with highest ratings in the no-sync condition, moderate ratings in the dissynchronous condition, and lowest in the synchronous condition. These patterns resulted in a very complex interaction.

Finally, sociability dimension results obtained a significant main effect for synchrony, $F(2, 166) = 5.90$, $p < .05$. Inspection of the

TABLE 16
SUMMARY OF MEANS FOR SOURCE CREDIBILITY DIMENSIONS

Effect	<u>N</u>	$\bar{X}$ Competence	
<u>Speaker</u>			
1	87	19.89	
2	91	20.00	
<u>Rate</u>			
Normal	91	19.53	
Fast	87	20.47	
<u>Synchrony</u>			
Synchronous	60	20.81	
Dissynchronous	57	17.75	
No-sync	61	21.27	
<u>Rate x Synchrony</u>			
Normal	Synchronous	No-sync	Dissynchronous
	19.63 <u>N</u> = 30	20.96 <u>N</u> = 31	17.96 <u>N</u> = 30
Fast	22.00 <u>N</u> = 30	21.60 <u>N</u> = 30	17.51 <u>N</u> = 27
<u>Speaker x Rate</u>			
1	Normal	Fast	
	19.71 <u>N</u> = 45	20.09 <u>N</u> = 42	
2	19.36 <u>N</u> = 46	20.82 <u>N</u> = 45	
<u>Speaker x Synchrony</u>			
1	Synchronous	No-sync	Dissynchronous
	20.75 <u>N</u> = 28	20.70 <u>N</u> = 30	18.24 <u>N</u> = 29
2	20.87 <u>N</u> = 32	21.83 <u>N</u> = 31	17.25 <u>N</u> = 28
<u>Speaker x Rate x Synchrony</u>			
Normal	Synchronous	Speaker 1 No-sync	Dissynchronous
	20.78 <u>N</u> = 14	19.80 <u>N</u> = 15	18.68 <u>N</u> = 16
Fast	20.71 <u>N</u> = 14	21.60 <u>N</u> = 15	17.69 <u>N</u> = 13

TABLE 16 - Continued

	Synchronous	Speaker 2 No-sync	Dissynchronous
Normal	18.62 <u>N = 16</u>	22.06 <u>N = 16</u>	17.14 <u>N = 14</u>
Fast	23.12 <u>N = 16</u>	21.60 <u>N = 15</u>	17.35 <u>N = 14</u>

Effect	<u>N</u>	$\bar{X}$ Composure	
<u>Speaker</u>			
1	87	14.35	
2	91	15.28	
<u>Rate</u>			
Normal	91	15.28	
Fast	87	14.35	
<u>Synchrony</u>			
Synchronous	60	16.48	
Dissynchronous	57	12.61	
No-sync	61	15.27	
<u>Rate x Synchrony</u>			
	Synchronous	No-sync	Dissynchronous
Normal	16.13 <u>N = 30</u>	16.29 <u>N = 31</u>	13.40 <u>N = 30</u>
Fast	16.83 <u>N = 30</u>	14.23 <u>N = 30</u>	11.74 <u>N = 27</u>
<u>Speaker x Rate</u>			
	Normal	Fast	
1	14.51 <u>N = 45</u>	14.19 <u>N = 42</u>	
2	16.04 <u>N = 46</u>	14.51 <u>N = 45</u>	
<u>Speaker x Synchrony</u>			
	Synchronous	No-sync	Dissynchronous
1	15.85 <u>N = 28</u>	14.60 <u>N = 30</u>	12.65 <u>N = 29</u>
2	17.03 <u>N = 32</u>	15.93 <u>N = 31</u>	12.57 <u>N = 28</u>

TABLE 16 - Continued

Speaker x Rate x Synchrony

	Synchronous	Speaker 1 No-sync	Dissynchronous
Normal	16.07 <u>N</u> = 14	15.20 <u>N</u> = 15	12.50 <u>N</u> = 16
Fast	15.64 <u>N</u> = 14	14.00 <u>N</u> = 15	12.84 <u>N</u> = 13
	Synchronous	Speaker 2 No-sync	Dissynchronous
Normal	16.18 <u>N</u> = 16	17.31 <u>N</u> = 16	14.42 <u>N</u> = 14
Fast	17.87 <u>N</u> = 16	14.46 <u>N</u> = 15	10.71 <u>N</u> = 14

Effect	<u>N</u>	$\bar{X}$ Extroversion	
<u>Speaker</u>			
1	87	20.55	
2	91	21.17	
<u>Rate</u>			
Normal	91	18.85	
Fast	87	22.97	
<u>Synchrony</u>			
Synchronous	60	22.60	
Dissynchronous	57	19.47	
No-sync	61	20.47	
<u>Rate x Synchrony</u>			
	Synchronous	No-sync	Dissynchronous
Normal	20.86 <u>N</u> = 30	19.35 <u>N</u> = 31	16.33 <u>N</u> = 30
Fast	24.33 <u>N</u> = 30	21.63 <u>N</u> = 30	22.96 <u>N</u> = 27
<u>Speaker x Rate</u>			
	Normal	Fast	
1	17.91 <u>N</u> = 45	23.38 <u>N</u> = 42	
2	19.78 <u>N</u> = 46	22.60 <u>N</u> = 45	

TABLE 16 - Continued

Speaker x Synchrony

	Synchronous	No-sync	Dissynchronous
1	22.71 <u>N</u> = 28	20.13 <u>N</u> = 30	18.89 <u>N</u> = 29
2	22.50 <u>N</u> = 32	20.80 <u>N</u> = 31	20.07 <u>N</u> = 28

Speaker x Rate x Synchrony

	Synchronous	Speaker 1 No-sync	Dissynchronous
Normal	20.64 <u>N</u> = 14	18.53 <u>N</u> = 15	14.93 <u>N</u> = 16
Fast	24.78 <u>N</u> = 14	21.73 <u>N</u> = 15	23.76 <u>N</u> = 13
	Synchronous	Speaker 2 No-sync	Dissynchronous
Normal	21.06 <u>N</u> = 16	20.12 <u>N</u> = 16	17.92 <u>N</u> = 14
Fast	23.93 <u>N</u> = 16	21.53 <u>N</u> = 15	22.21 <u>N</u> = 14

Effect	<u>N</u>	<u>X</u> Character
<u>Speaker</u>		
1	87	17.54
2	91	17.69
<u>Rate</u>		
Normal	91	17.65
Fast	87	17.57
<u>Synchrony</u>		
Synchronous	60	17.70
Dissynchronous	57	16.80
No-sync	61	18.29

Rate x Synchrony

	Synchronous	No-sync	Dissynchronous
Normal	17.66 <u>N</u> = 30	18.35 <u>N</u> = 31	16.93 <u>N</u> = 30
Fast	17.73 <u>N</u> = 30	18.23 <u>N</u> = 30	16.66 <u>N</u> = 27

TABLE 16 - Continued

Speaker x Rate

1	Normal	Fast
	17.80	17.26
2	17.52	17.86
	<u>N</u> = 45	<u>N</u> = 42
	17.52	17.86
	<u>N</u> = 46	<u>N</u> = 45

Speaker x Synchrony

1	Synchronous	No-sync	Dissynchronous
	17.67	17.50	17.44
2	17.71	19.06	16.14
	<u>N</u> = 28	<u>N</u> = 30	<u>N</u> = 29
	17.71	19.06	16.14
	<u>N</u> = 32	<u>N</u> = 31	<u>N</u> = 28

Speaker x Rate x Synchrony

Normal	Synchronous	Speaker 1 No-sync	Dissynchronous
	18.57	17.06	17.81
Fast	16.78	17.93	17.00
	<u>N</u> = 14	<u>N</u> = 15	<u>N</u> = 13
Normal	Synchronous	Speaker 2 No-sync	Dissynchronous
	16.87	19.56	15.92
Fast	16.56	18.53	16.35
	<u>N</u> = 16	<u>N</u> = 16	<u>N</u> = 14
	16.56	18.53	16.35
	<u>N</u> = 16	<u>N</u> = 15	<u>N</u> = 14

Effect	<u>N</u>	$\bar{X}$ Sociability
<u>Speaker</u>		
1	87	16.33
2	91	16.65
<u>Rate</u>		
Normal	91	16.27
Fast	87	16.73
<u>Synchrony</u>		
Synchronous	60	17.51
Dissynchronous	57	15.36
No-sync	61	16.55

TABLE 16 - Continued

<u>Rate x Synchrony</u>			
Normal	Synchronous	No-sync	Dissynchronous
	17.56 <u>N</u> = 30	16.45 <u>N</u> = 31	14.80 <u>N</u> = 30
Fast	17.45 <u>N</u> = 30	16.66 <u>N</u> = 30	16.00 <u>N</u> = 27
<u>Speaker x Rate</u>			
1	Normal	Fast	
	16.17 <u>N</u> = 45	16.50 <u>N</u> = 42	
2	16.36 <u>N</u> = 46	16.95 <u>N</u> = 45	
<u>Speaker x Synchrony</u>			
1	Synchronous	No-sync	Dissynchronous
	17.82 <u>N</u> = 28	15.96 <u>N</u> = 30	15.27 <u>N</u> = 29
2	17.25 <u>N</u> = 32	17.12 <u>N</u> = 31	15.46 <u>N</u> = 28
<u>Speaker x Rate x Synchrony</u>			
Normal	Synchronous	Speaker 1 No-sync	Dissynchronous
	18.71 <u>N</u> = 14	15.60 <u>N</u> = 15	14.50 <u>N</u> = 16
Fast	16.92 <u>N</u> = 14	16.33 <u>N</u> = 15	16.23 <u>N</u> = 13
Normal	Synchronous	Speaker 2 No-sync	Dissynchronous
	16.56 <u>N</u> = 16	17.25 <u>N</u> = 16	15.14 <u>N</u> = 14
Fast	17.93 <u>N</u> = 16	17.00 <u>N</u> = 15	15.78 <u>N</u> = 14

synchrony main effect means for sociability suggested that synchronous messages were evaluated as most sociable ($\bar{X} = 17.51$) followed by no-sync messages ($\bar{X} = 16.55$) and then dissynchronous messages ($\bar{X} = 15.36$). A summary of the analysis of variance effects for the credibility dimensions may be found in Tables 17, 18, and 19.

A final analysis on the source credibility data was performed to clearly assess the possibility that synchronized coverbal cues function strictly as credibility bolsterers. The design was collapsed to a one-way analysis of variance for all treatment conditions (conditions 1 through 8) on the source credibility dimensions. If coverbal cues do operate to enhance source credibility, then those conditions in which those cues are absent (conditions 3 and 6, the no-cues and the audio-only condition, conditions 7 and 8) should have significantly lower source credibility scores than conditions in which the synchronized coverbal cues are present (conditions 1 and 4). The one-way ANOVA for condition produced significant F values at $p \leq .05$ or less for all credibility dimensions except character, which revealed a trend, $F(7, 237) = 1.81, p = .08$. A summary of these effects and the associated condition means may be found in Table 20.

Duncan's multiple range test was used to probe for differences between condition means for each dimension of credibility except character. For the dimensions of competence, composure, and sociability, no differences were detected between the no-cues conditions (3 and 6), the audio-only conditions (7 and 8), and the synchronized cue conditions (1 and 4). For extroversion, condition 4 (fast rate, synchronous cues) was significantly different from condition 6 (fast rate, no cues) and condition 1 (normal rate, synchronous cues) only. Due to the lack of a

TABLE 17
ANOVA SUMMARY FOR SOURCE CREDIBILITY DIMENSIONS

-Competence-

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	.4925	1	.49	.03
Rate	30.5817	1	30.58	1.68
Synchrony	431.6601	2	215.83	11.82*
Rate x Synchrony	50.0998	2	25.04	1.37
Speaker x Rate	15.2333	1	15.23	.83
Speaker x Synchrony	31.4972	2	15.74	.86
Speaker x Rate x Synchrony	88.0780	2	44.03	2.41
Error	3030.3870	166	18.25	

*p < .05

-Composure-

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	27.4623	1	27.46	1.10
Rate	46.6191	1	46.61	1.87
Synchrony	442.3363	2	221.16	8.86*
Rate x Synchrony	62.2055	2	31.10	1.25
Speaker x Rate	15.8613	1	16.86	.64
Speaker x Synchrony	17.2608	2	8.63	.35
Speaker x Rate x Synchrony	70.7688	2	35.38	1.42
Error	4145.8792	166	24.97	

*p < .05

TABLE 18
ANOVA SUMMARY FOR SOURCE CREDIBILITY DIMENSIONS

-Extroversion-

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	7.0834	1	7.08	.47
Rate	753.4080	1	753.40	50.27*
Synchrony	264.2440	2	132.12	8.81*
Rate x Synchrony	139.9832	2	69.99	4.67*
Speaker x Rate	71.1808	1	71.18	4.75*
Speaker x Synchrony	8.4016	2	4.2	.28
Speaker x Rate x Synchrony	22.4088	2	11.20	.75
Error	2488.1273	166	14.98	

* $p < .05$

-Character-

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	.5189	1	.51	.07
Rate	.5113	1	.51	.07
Synchrony	66.8874	2	33.44	4.43*
Rate x Synchrony	.1623	2	.081	.01
Speaker x Rate	9.7751	1	9.77	1.29
Speaker x Synchrony	58.2626	2	29.13	3.86*
Speaker x Rate x Synchrony	54.9075	2	27.45	3.64*
Error	1253.5910	166	7.55	

* $p < .05$

TABLE 19
ANOVA SUMMARY FOR SOURCE CREDIBILITY DIMENSIONS

-Sociability-

Source	Sum of Squares	d.f.	Mean Squares	F
Speaker	2.3150	1	2.31	.21
Rate	7.3638	1	7.36	.66
Synchrony	130.8951	2	65.44	5.90*
Rate x Synchrony	14.6248	2	7.31	.66
Speaker x Rate	1.4606	1	1.46	.13
Speaker x Synchrony	22.9649	2	11.48	1.04
Speaker x Rate x Synchrony	43.5816	2	21.79	1.96
Error	1840.9731	166	11.09	

* $p < .05$

TABLE 20

SUMMARY OF ONE-WAY ANOVAS FOR SOURCE CREDIBILITY DIMENSIONS

Source	Sum of Squares	d.f.	Mean Squares	F
-Competence-				
Condition	584.7374	7	83.53	4.53*
Error	4373.0747	237	18.45	
-Composure-				
Condition	1229.8860	7	175.69	7.40*
Error	5629.8690	237	23.75	
-Extroversion-				
Condition	1350.0173	7	192.85	13.92*
Error	3283.4357	237	13.85	
-Character-				
Condition	120.9129	7	17.27	1.81
Error	2265.1931	237	9.55	
-Sociability-				
Condition	226.4648	7	32.35	2.66*
Error	2881.5759	237	12.15	

* $p < .05$

Summary of Condition Means for Source Credibility Dimensions

Condition	N	$\bar{X}$ Competence	$\bar{X}$ Composure	$\bar{X}$ Extroversion	$\bar{X}$ Character	$\bar{X}$ Sociability
1 normal synchronous	30	19.63	16.13	20.86	17.66	17.56
2 normal dissynchronous	30	17.96	13.40	16.33	16.93	14.80
3 normal no-sync	31	20.96	16.29	19.35	18.35	16.45
4 fast synchronous	30	22.00	16.83	24.33	17.73	17.46
5 fast dissynchronous	27	17.51	11.74	22.96	16.66	16.00
6 fast no-sync	30	21.60	14.23	21.63	18.23	16.66
7 normal audio only	31	21.54	19.64	22.70	18.67	18.09
8 fast audio only	36	20.38	16.80	22.72	16.88	16.44

significant overall effect, probing by Duncan's range test on character condition means was not performed. The overall pattern of these means, and the results of the Duncan's tests, indicates lack of source credibility differences for competence, composure, extroversion and sociability between conditions which do and do not have synchronized coverbal cues.

As can be seen from the Duncan's results, the dissynchronous conditions (conditions 2 and 5) were consistently significantly different from the other conditions on the competence, composure, and sociability dimensions, thus probably producing the significant overall F effects in those analyses. However, significant differences between conditions which contain synchronized coverbal cues and conditions which do not contain those cues were not found. A summary of the Duncan's range tests for each credibility dimension except for character may be found in Tables 21 and 22.

Experimental and control group comparisons. A final analysis was performed to compare the mean attitude scores for all experimental conditions (conditions 1 through 8) to the no-message control group mean. A Dunnett's multiple comparison t test for unequal N was the statistic used. Results for the semantic differential measure of attitude indicated that the mean of conditions 1, 3, 4, and 8 were significantly different from the control group mean, while conditions 2, 5, 6, and 7 were not significantly different. For the known interval measure, only the mean of condition 1 proved to be significantly different from the control group mean. A summary of these results is presented in Table 23.

TABLE 21
SUMMARY OF DUNCAN'S MULTIPLE RANGE TEST

-Competence-

Condition	<u>N</u>	$\bar{X}$	Grouping*
4 fast synchronous	30	22.00	A
6 fast no-sync	30	21.60	A
7 normal audio only	31	21.54	A
3 normal no-sync	31	20.96	A
8 fast audio only	36	20.38	A
1 normal synchronous	30	19.63	A B
2 normal dissynchronous	30	17.96	B
5 fast dissynchronous	27	17.51	B

*Means with the same letter are not significantly different.

$p < .05$

-Composure-

Condition	<u>N</u>	$\bar{X}$	Grouping*
7 normal audio only	31	19.64	A
4 fast synchronous	30	16.83	B
8 fast audio only	36	16.80	B
3 normal no-sync	31	16.29	B
1 normal synchronous	30	16.31	B
6 fast no-sync	30	14.23	B C
2 normal dissynchronous	30	13.40	C
5 fast dissynchronous	27	11.74	C

*Means with same letter are not significantly different.

$p < .05$

TABLE 22
SUMMARY OF DUNCAN'S MULTIPLE RANGE TEST

-Extroversion-

Condition	N	$\bar{X}$	Grouping*
4 fast synchronous	30	24.33	A
5 fast dissynchronous	27	22.96	A B
8 fast audio only	36	22.72	A B
7 normal audio only	31	22.70	A B
6 fast no-sync	30	21.63	B
1 normal synchronous	30	20.86	B C
3 normal no-sync	31	19.35	C
2 normal dissynchronous	30	16.33	D

*Means with the same letter are not significantly different.

$p < .05$

-Sociability-

Condition	N	$\bar{X}$	Grouping*
7 normal audio only	31	18.09	A
1 normal synchronous	30	17.56	A B
4 fast synchronous	30	17.46	A B
6 fast no-sync	30	16.66	A B C
3 normal no-sync	31	16.45	A B C
8 fast audio only	36	16.44	A B C
5 fast dissynchronous	27	16.00	B C
2 normal dissynchronous	30	14.80	C

*Means with same letter are not significantly different.

$p < .05$

TABLE 23

SUMMARY OF EXPERIMENTAL GROUP-CONTROL GROUP COMPARISONS
BY DUNNETT'S MULTIPLE COMPARISON TEST

-Semantic Differential Attitude Measure-

Condition	<u>N</u>	<u>X̄</u>
1 normal synchronous	30	15.96*
2 normal dissynchronous	30	13.43
3 normal no-sync	31	14.06*
4 fast synchronous	30	15.06*
5 fast dissynchronous	27	13.00
6 fast no-sync	30	13.76
7 normal audio only	31	13.51
8 fast audio only	36	13.97*
9-control	29	10.68

*Significantly different from control mean at $p < .05$.

-Known Interval Attitude Measure-

Condition	<u>N</u>	<u>X̄</u>
1 normal synchronous	30	6.21*
2 normal dissynchronous	30	4.90
3 normal no-sync	31	5.36
4 fast synchronous	30	5.55
5 fast dissynchronous	27	4.94
6 fast no-sync	30	5.32
7 normal audio only	31	5.12
8 fast audio only	36	5.08
9-control	29	4.24

*Significantly different from control mean at $p < .05$.

CHAPTER IV

DISCUSSION

Summary of Results

The results of the present study were partially supportive of the first hypothesis, that there would be greater message comprehension in synchronous message conditions than in dissynchronous message conditions. Support for this hypothesis was found only on the recall measure. The recognition measure of comprehension did not reflect support for this hypothesis. Other unpredicted significant effects obtained in the analysis were significant speaker blocking effects for both recall and recognition. In both cases, messages which speaker two performed resulted in higher comprehension scores than messages which speaker one performed.

Hypothesis two, which predicted greater comprehension in conditions with synchronized coverbal cues than in no-cues conditions, was not supported. The planned comparison t test performed revealed no significant difference between the synchronous and no-sync means for both the recall and recognition measures. Hypothesis three, which predicted greater message comprehension in synchronous conditions than in the audio only conditions received no support. The planned orthogonal contrast which compared the synchronous and audio only means proved nonsignificant for both measures of comprehension.

Hypothesis four predicted an interaction between rate and synchrony on attitude yielding. Specifically, this hypothesis predicted that

subjects would be significantly more persuaded by a synchronous fast rate message than by a synchronous normal rate message or dissynchronous messages regardless of rate. This prediction did not receive support in the present investigation. The rate by synchrony interaction effect obtained in the analysis was nonsignificant for both measures of attitude yielding. An unhypothesized effect which was found to be significant in the analysis was the synchrony main effect on the known interval measure. A near significant synchrony main effect was found on the semantic differential measure. For both measures, the pattern of means suggested synchronous messages to be more persuasive than dissynchronous messages and that synchronous messages had stronger persuasive impact than no-sync messages, although such differences may not have been significantly different.

Hypothesis five predicted an interaction between rate and synchrony on distraction. This hypothesis predicted that subjects would be highly distracted by dissynchronous messages at both normal and fast rates, that subjects would be moderately distracted by synchronous messages at fast rates while subjects receiving synchronous normal rate messages would not be distracted. This prediction was not supported by the present investigation. The rate x synchrony interaction effect in the distraction analysis was nonsignificant. The ordering of the distraction means, however, did conform to the pattern predicted by this hypothesis.

A number of unhypothesized effects were found to be significant in the distraction analysis. A significant synchrony main effect was obtained, and the pattern of the main effect means suggested dissynchronous messages to be more distracting than synchronous or no-sync

messages. A significant main effect for rate was also found and the main effect means suggested that fast rate messages were more distracting than normal rate messages. Finally, a significant speaker blocking effect and a trend for a speaker by synchrony interaction were obtained in the analysis on distraction. The speaker main effect means suggested speaker one to be more distracting than speaker two, while the interaction means suggested that speaker two was much more distracting than speaker one in the dissynchronous and no-sync conditions, but that the distractive effect was nearly equivalent for both speakers in the synchronous conditions.

Hypothesis six predicted an interaction between rate and synchrony on counterarguing. Specifically, subjects receiving synchronous fast rate messages would engage in significantly less counterarguing than subjects receiving synchronous normal rate messages, or dissynchronous messages regardless of rate. The results of the counterarguing analysis did not support this prediction for the message attack, source derogation, or overall counterarguing measures. The analysis yielded some un-hypothesized significant effects, however. Significant speaker blocking effects were found for the message attack and source derogation measures. Speaker main effect means suggested that more message attack counterarguing was associated with speaker two delivery than with speaker one and that more source derogation was associated with speaker one than with speaker two. Additionally, a significant main effect for synchrony was obtained for source derogation and overall counterarguing. The main effect means for both measures suggested that dissynchronous messages resulted in more counterarguing behavior by receivers than did synchronous or no-sync messages.

Hypothesis seven predicted significantly greater attitude yielding for synchronous fast rate messages than for fast rate messages in which synchronized coverbal cues are not performed (fast rate; no-sync condition). The results of the planned t test used to test this prediction were nonsignificant and thus hypothesis seven did not receive support. Hypothesis eight predicted significantly greater attitude yielding for synchronous fast rate messages than for fast rate messages received on the audio channel only. The planned orthogonal contrast used to test this hypothesis proved nonsignificant. Therefore, hypothesis eight was not supported in this investigation.

Concerning the predictions made for comprehension, the results supportive of hypothesis one indicate that the synchronization of coverbal cues facilitates message comprehension while the dissynchronization of coverbal cues distracts receivers and harms message comprehension. However, due to lack of support for hypothesis two and three, the extent to which synchronized coverbal cues may facilitate message comprehension remains unclear. The lack of differences between no-sync and synchronous message conditions, as well as the audio only and synchronous message conditions, may suggest that synchronized coverbal cues do not facilitate message comprehension. An alternative interpretation of these results is that synchronized coverbal cues do facilitate message comprehension. However, the vocalic cues (rhythm, pitch, intonation) still present in the no-sync and audio only conditions may constitute experimental artifacts which might have facilitated comprehension and thus negated differences between these conditions and the synchronous message conditions. Thus, conclusions about the facilitative effect of synchronized coverbal cues on comprehension remain tentative and should be subjected to further study.

The lack of support for the interactive predictions on distraction, counterarguing, and attitude yielding may be due to a number of factors. One possible factor for the lack of significant interaction effects is that the fast synchronous encoding condition did not moderately distract receivers as predicted. Receivers were either highly distracted by dissynchronous messages or minimally distracted by synchronous or no-sync messages. The level of distraction provided by fast rate synchronous messages may not have been sufficient to focus receivers on the delivery of the message and away from message content. The support for the counterarguing and yielding interactions was dependent upon achieving a moderate distraction on receivers. Thus, the failure to moderately distract receivers away from message content affected the outcomes of the counterarguing and yielding hypotheses. Other reasons for the lack of the predicted interaction effects such as lack of power and methodological problems will be discussed further in the section dealing with limitations of the study.

The lack of a moderately distractive effect in the fast rate synchronous message condition may also explain why the predicted comparisons in hypotheses seven and eight were nonsignificant. If the fast rate synchronous message condition had moderately distracted receivers from the content of the message, the persuasive impact of the message might have been greater than it actually was and thus the predicted comparisons would have been significant. Given the important role that nonverbal sources of distraction play in the present rationale, such distractive effects should be a topic of further discussion and investigation.

There are several significant unhypothesized effects in the results which require comment. One such aspect of the results is the consistent

pattern of synchrony main effects found in the distraction, counterarguing, and attitude yielding analysis. Although these main effects were expected, they were not hypothesized because of the overriding interaction predictions. Therefore, the implications of these results are tentative. The results indicated that synchronous messages were less distractive than dissynchronous messages, that dissynchronous messages produced more receiver counterarguing than synchronous messages, and that synchronous messages were more persuasive than dissynchronous messages. It should be noted that the counterarguing differences were due primarily to the source derogation component of counterarguing. Typically, the least distractive message condition results in the greatest amount of counterarguing behavior (Osterhouse & Brock, 1970). However, when source derogation is considered as a counterarguing component, the present results suggest that the opposite relationship is obtained, i.e., that the most distracting message condition results in the greatest amount of source derogating counterarguing. These results also suggest that the dissynchronous message conditions did operate to induce a distracting task set by focusing receivers away from message content and onto the unsynchronized message delivery. As a result of focusing on the unsynchronized message delivery, source derogation was facilitated.

Overall, these results suggest that message synchrony is an important aspect of the overall package of coverbal cues used in persuasive discourse. The synchronization of coverbal cues to the rhythm of speech may have a strong influence on receiver yielding to counterattitudinal messages. Although there are other strategies that a speaker may use to influence receiver attitudes, for strategies that involve the effective use of coverbal cues, message synchrony may be an important

factor. However, given the tentative nature of the results, the relationships between message synchrony, vocal rate, distraction, counterarguing and yielding should be subjected to further study.

Another aspect of the analysis which requires comment is the number of significant speaker blocking effects. Significant blocking effects for speaker were found for the measures of comprehension, distraction, and counterarguing. Additionally, a near significant trend was obtained for a speaker by synchrony interaction in the distraction analysis. These effects indicate a lack of equivalence between the two speakers across the experimental encoding conditions. Although the blocking effects controlled for speaker differences, speaker nonequivalence may have clouded the results, particularly the results for distraction. Suggestions for ways to achieve further control over such nonequivalence will be made at a later point.

Finally, results of the supplemental credibility analyses suggest a number of implications. Interpretable main effects for synchrony were obtained which indicated synchronous and no-sync messages to be superior to dissynchronous messages for competence, composure, character and sociability. The interactions obtained for the extroversion dimension (rate by synchrony, speaker by rate interactions) suggest this dimension to be particularly sensitive to rate manipulations. Given that speaker one did speak slightly faster than speaker two across conditions, the speaker by rate interaction shows just how sensitive extroversion is to rate differences. Interestingly, Gundersen and Hopper (1976) also found the extroversion dimension to be particularly sensitive to delivery manipulations.

Overall, the pattern of credibility results may not lend support to a credibility bolstering explanation of attitude change. If coverbal

cues functioned strictly to bolster credibility and thus facilitate attitude change, elimination of those cues would result in a drop in credibility. However, inspection of the synchronous main effect means for the factorial credibility analyses revealed that no-sync conditions, where such cues had been eliminated, were not different from the synchronous conditions in terms of credibility. Further, in the one-way credibility analyses, there were no significant or consistent differences found between encoding conditions in which coverbal cues were performed (synchronous conditions) and those conditions in which such cues were not performed (no-sync and audio-only conditions). If coverbal cues do operate as credibility bolsterers, differences between these conditions should have been detected.

An alternative interpretation of the credibility results might be that when much of the coverbal activity was eliminated in the no-sync and audio only conditions, receivers focused on the coverbal and vocal cues remaining. As a result, those cues operated in a stronger than normal manner to bolster credibility. Thus, a credibility bolstering explanation cannot be entirely discounted. A clear method of assessing just exactly what receivers focus on in a given encoding condition would lessen the ambiguity of the present results.

What the credibility results may also suggest is that the desynchronization of coverbal cues functions to completely distract receiver attention from message content and focus receiver attention on the unsynchronized aspects of delivery. The unsynchronized coverbal cues may have resulted in negative effects on the credibility evaluation of the source. It is not clear, however, that synchronized coverbal cues facilitated credibility ratings, or affected attitude yielding,

since the absence of those cues did not result in lower credibility evaluations by receivers, or significantly lessen the persuasive impact of the message. It may be that, although coverbal cues and their synchronization influences credibility evaluations as well as other aspects of a receiver's impression of a source, such source-centered evaluations may not directly affect a receiver's attitudes on a counterattitudinal topic. Exactly how such source related information affects a receiver's position on a counterattitudinal topic remains unclear. The present rationale suggests that synchronized coverbal cues that influence a receiver's impression of a source function to moderately distract receivers from the content of the message and focus attention towards the delivery aspects of the message. Given the lack of a moderately distractive effect by the synchronous fast rate message condition, results supporting the rationale are inconclusive.

One further aspect of the analysis requires comment. The experimental-control group comparisons for the semantic differential attitude measure indicated that all synchronous message conditions, as well as the fast rate audio-only condition, had significantly more favorable attitude scores than the control group. However, the same comparisons for the known interval measure indicated that only the normal rate synchronous message condition was significantly more favorable than the control group condition. The reason for this discrepancy between the two measures in experimental-control group comparisons is not clear, particularly in light of the high correlation between the two measures reported earlier. Either the impact of the experimental treatments, or the adequacy of the attitude measures might be called into question here, but it is not clear which.

Limitations of the Study

There are a number of methodological and limiting concerns in the present investigation which warrant further discussion. One concern involves the mixed support for hypothesis one. Although hypothesis one was supported by the recall measure of comprehension, no support was obtained on the recognition measure. There are several possible explanations for the discrepancy between the recall and recognition measures. One possibility is that the measures are tapping slightly different comprehension processes. Recall may be seen as a measure of a short-term memory process which involves feeding back information received. Recognition, on the other hand, may be a different comprehension process involving longer term storage of information. Thus, these two different comprehension processes may not be highly related. In support of this point, it should be noted that the recall and recognition scores in the present investigation were not highly correlated ($r = .37$). Given that the comprehension measures were taken almost immediately after message reception, the recall measure tapping short-term memory may be more sensitive to differences in comprehension across encoding conditions. Another likely explanation for lack of results on recognition is that the measure itself was not sensitive to differences in comprehension. The multiple-choice questions and the true-false questions used to measure recognition may have been too general and not difficult enough to adequately discriminate between different levels of message comprehension in subjects. Future studies should take the measurement problems associated with comprehension into account.

Another limitation of the present study involves a consideration of the reasons for the lack of a moderately distracting effect

predicted for the synchronous fast rate encoding condition. Reasons for lack of a moderately distracting effect may involve some aspect of the rate or the synchrony manipulations. It is possible that the particular configuration of synchronized coverbal cues in the synchronous fast rate messages was not sufficient to moderately distract receivers from the content of the message. It is possible that either the amount of coverbal activity, or the type of coverbal activity in the fast rate synchronous condition was not appropriate to moderately distract subjects.

A more likely possibility, and probably the strongest limitation of the study, is that the differences between normal and fast rate manipulations were not sufficiently large enough. Although there is a suggested range, the literature on vocal rate does not clearly indicate what word per minute level would constitute a normal rate for receivers in an interactional context. Differences between normal and fast word per minute level across conditions were approximately 20 wpm. Thus, the normal rate may have actually been too fast for receivers. In addition, the difference between normal and fast rates may not have been large enough to be experimentally comparable. Although receivers found fast rates to be significantly more distracting than normal rates, even with the small difference between rate manipulations, a larger difference in rate manipulation, accomplished by using a slower normal rate wpm level, might have resulted in the predicted interaction for distraction.

A further limitation of the present investigation involves the level of power in the test of the hypotheses. A consistently low level of power for hypothesized but unsupported effects raises concern as to whether the present study is an adequate test of the hypotheses. One factor which causes low power in statistical designs is high error

variance (Hays, 1963). Error variance, which may be attributed to experimental or sampling error, or to other extraneous sources of variance within a design, may be reduced by increasing experimental control of independent variable manipulations, as well as identifying other extraneous sources of variance. Thus, increasing the precision of the experiment may result in an increase in statistical power and a more adequate test of the hypotheses. Given the large error terms evident in the present investigation's analyses, an increase in the precision of the present methodology should allow for a more adequate test of the hypotheses in future research.

Several procedures might be followed to increase the precision of the present study. One procedure is to use more extensive pre-test manipulation checks to assess the independent variable manipulations. Although a panel of judges was used to assess the manipulations in this study, a more extensive procedure involving larger numbers of judges, or a pilot study, could be used to tighten the control of independent variable manipulations and thus eliminate possible uncontrolled sources of variance. Another procedure that might increase experimental precision is a more extensive training period for experimental speakers and a further standardization of the coverbal cues the speakers perform. In the present study, the second speaker used the first speaker's videotaped performance as a guide, and modeled much of the first speaker's performance. Thus, a certain amount of equivalence in the nonverbal performance of speakers was achieved. However, a fairly detailed behavioral script that accompanies the verbal message script could be written, and different speakers could practice the performance

using such a script. A higher degree of precision and control over the performance of coverbal cues might be achieved using such a procedure.

Another facet of the experimental manipulations which might have been somewhat imprecise was the rate of speech levels for the speakers. The wpm level of speaker one was consistently slightly faster than the wpm level of speaker two, although the differences are small, being less than 10 wpm for any given encoding condition. This slight difference might explain the unpredicted speaker by rate interaction effect that was near significance in the extroversion analysis. A more precise rate manipulation across speakers might have reduced the error variance and increased the power of hypothesized effects in the present study.

As stated earlier, manipulating nonverbal factors in a controlled yet realistic way is often very difficult. Following the suggested procedures might lessen some of the difficulty, allow a more precise manipulation of nonverbal factors, and result in an increase in statistical power. Consideration of these suggestions in future research should allow for a clearer test of the present rationale.

Recommendations for Future Research

There are several important directions for future research to take. One direction of investigation that the present work has indicated to be important is the distraction potential of coverbal cues. Further research to determine what coverbal aspects of messages may induce receivers to focus on the delivery of the message and away from message content is clearly needed. The effects of nonverbal factors on receiver attention is a general area in need of further research.

Another possibility for future research is to extend the present rationale to live, face-to-face interactions and attempt to assess the effects of interactional synchrony, where listeners coordinate their nonverbal dynamic movements to the rhythm of the speaker's speech. An interactional synchrony effect might be very promising in terms of providing a moderate level of distraction for receivers. Here, the possible nonverbal sources of distraction extend beyond a speaker's coverbal activity to the listener's own synchronized movements. Thus, the listener's own nonverbal movements might provide further sources of distraction and facilitate focusing attention on message delivery. In the process of being synchronized to the speaker, a listener may be further distracted from message content and focus more towards message delivery. Under such conditions, counterarguing might be reduced and receivers might be more susceptible to influence.

Finally, further investigation into the rhythmic and temporal aspects of communication should provide needed information about message structure and the nature of message encoding and decoding. Research on the phonemic clause unit, vocal rhythm, and how these factors are involved in the encoding and decoding of messages are topics of recent interest in communication research and should continue to be so (Boomer, 1978). Research in this area should also further clarify the nature of the coverbal synchronization process and how synchrony is related to other communication factors.

The present work attempted to take a multi-channel perspective which considers temporal and organizational aspects of messages and make some predictions about how such factors might affect information

processing and communication outcomes. Further research on the nature of multi-channel message systems and the effects such systems have on other communication processes is needed. By considering relationships between the simultaneous aspects of message exchange, a significant step towards a more complete explanation of communication is made.

APPENDIX A
EXPERIMENTAL MESSAGE

EXPERIMENTAL MESSAGE

One of the major problems facing many universities today is the increasing cost of higher education. Rising costs in many areas, and inadequate funding of educational programs are problems which threaten the quality and vitality of our higher educational system. This growing problem is one which concerns and affects all of us. We need to take a close and careful look at ways to solve the funding problems of universities, and this university in particular. Although funding problems are complex and will only be corrected by solutions on a number of different levels, we feel that one of the most basic, effective and immediate ways of solving funding problems is by increasing undergraduate tuition by 20%.

One of the main reasons that a tuition increase is an effective solution involves the matching funds an increase would generate. The actual costs of running a university are not covered by students' tuition alone, but are met by matching funds received from federal and state sources. For every tuition dollar a student pays, state and federal agencies quadruple that amount, and thus generate a university's operating funds. A moderate increase in tuition then, would result in a good deal of funding, which would help cover increasing costs.

Another reason why a tuition increase is a viable way of dealing with current funding problems is that it's unlikely that money to cover increasing costs will come from other sources. The tax base in this state for funding education is simply inadequate. A recent survey indicated that Florida ranked 40th out of all states in terms of appropriations to higher education this year. Further, since this is an election year, it is very unlikely that the legislature will do

anything to change this grim state of affairs. Indeed, if the governor's budget is any indication, funding for higher education will remain at its present level; barely keeping up with inflation. Additional federal spending on education is also unlikely due to presidential budget tightening. In a year when prospects for increased educational spending are so dim, the only possible source of additional university funding is a tuition increase, and the matching funds the increase would generate.

A related argument is that there is an immediate need for increased funds which cannot be postponed, and that raising tuition is the most effective way of handling this. There are funding problems in several budget areas: an increase in faculty pay is needed to attract and keep high quality faculty. The library is in critical need of funding to continue replacement and acquisition of old and new books. Many departments and programs badly need to replace worn out and obsolete equipment. Finally, the recent rise in utility costs alone has caused the university severe budget strain. These problems are urgent ones which threaten the quality of education, and need to be dealt with immediately. Given that other sources of budget assistance are unlikely, a tuition increase is the only way of solving these immediate funding problems.

A final argument is that it's becoming increasingly necessary for students to shoulder more of the costs of their education. Students currently pay for roughly one-fifth of their education. As inflation continues, and the number of students continues to drop, more financial responsibility will fall on the student. Additionally, although any tuition increase may seem unpleasant, a 20% increase is moderate.

Indeed, when compared with tuition rates of other major universities in this region, a 20% increased tuition at this university is still slightly below other universities' tuition rates. Even with this increase, undergraduates at this university will still be paying slightly lower fees than students at other southeastern universities.

Obviously, the prospect of increased tuition are far worse. It is clear that the university is in need of increased funding, and that increased tuition and the accompanying matching funds are the only available source. A moderate increase which compares favorably with other southeastern universities is needed. We feel that these reasons warrant a 20% increase in undergraduate tuition.

APPENDIX B
INTERPERSONAL ATTRACTION SCALES

INTERPERSONAL ATTRACTION SCALES

Below are a series of statements about the person. Please place an "X" in the space which best reflects the degree to which you agree or disagree with the statement.

1. I think he could be a friend of mine.

Strongly agree _____ Strongly disagree

2. I couldn't get anything accomplished with him.

Strongly agree _____ Strongly disagree

3. It would be difficult to meet and talk with him.

Strongly agree _____ Strongly disagree

4. He is very sexy looking.

Strongly agree _____ Strongly disagree

5. If I wanted to get things done, I could probably depend upon him.

Strongly agree _____ Strongly disagree

6. I find him very attractive physically.

Strongly agree _____ Strongly disagree

7. We would never establish a personal friendship with each other.

Strongly agree _____ Strongly disagree

8. He would be a poor problem solver.

Strongly agree _____ Strongly disagree

9. I think he is quite handsome.

Strongly agree _____ Strongly disagree

10. I have confidence in his ability to get the job done.

Strongly agree _____ Strongly disagree

11. I would like to have a friendly chat with him.

Strongly agree _____ Strongly disagree

12. I don't like the way he looks.

Strongly agree _____ Strongly disagree

APPENDIX C

POST-EXPERIMENTAL MEASURES

RECALL MEASURE OF COMPREHENSION

Please list below everything that you remember about the points made in the message you received. List as much as you can recall about the message, regardless of whether a particular point seemed important or unimportant.

TRUE-FALSE RECOGNITION MEASURE

Below are a series of True-False statements about the message you received. Please indicate whether each is True or False according to the message by circling T for True or F for False. Please circle either T or F, but not both.

- T F 1. For every tuition dollar a student pays, state and federal agencies double that amount.
- T F 2. A recent survey has indicated that Florida ranked 40th out of all states for funding education this year.
- T F 3. Matching funds are received from federal agencies.
- T F 4. Students currently pay for one-half of their education.
- T F 5. The recent rise in utility costs has been comfortably and adequately handled by the university's budget.
- T F 6. The actual costs of running a university are not met by students' tuition alone.
- T F 7. Since this is an election year, it is very likely that the legislature will try to correct educational funding problems.
- T F 8. This state's tax base for funding education is more than adequate.
- T F 9. A 20% increased tuition is considerably higher than tuition rates at other regional universities.
- T F 10. Many departments and programs do not need to replace equipment at this time.
- T F 11. The library is in critical need of funding to continue acquisition of books.
- T F 12. As inflation continues and the number of students continues to decrease, less financial responsibility will fall on the student.

MULTIPLE-CHOICE RECOGNITION MEASURE

Below are a number of multiple-choice questions about the message you received. Please choose the best answer to the question from the alternatives by circling the letter of the correct answer and writing the letter in the blank space provided. For example:

- b 1. $2 + 2 + \underline{\hspace{1cm}}$
 a. 3
 b. 4
 c. 0
 d. 1
 e. 2

Please choose one answer only, and make certain that the letter you circle and the one you write in the blank space are the same. If you are somewhat uncertain about the correct answer, it is to your advantage to guess. If you are very uncertain about the correct answer, it may be to your advantage to not choose an answer.

- _____ 1. Which of the following funding sources actually covers the operating costs of the university?
 a. student tuition
 b. alumni contributions
 c. state and federal matching funds
 d. corporation grants
 e. gambling revenues
- _____ 2. According to the message, which of the following is correct?
 a. There will be a large increase in federal and state spending on education.
 b. There will be a large decrease in federal and state spending on education.
 c. The effects of inflation will not affect educational spending.
 d. The prospects for increased state and federal spending on education are dim.
 e. Corporate educational spending is increasing.
- _____ 3. According to the message, students are going to have to:
 a. deduct tuition costs from their income tax.
 b. attend college year round to finish earlier.
 c. shoulder more of the costs of their education.
 d. demonstrate higher academic competence to be accepted at a university.
 e. quit school and go to work to aid the sagging economy.
- _____ 4. Which of the following is true concerning the need for increased educational funds?
 a. There is an immediate need for increased funds which cannot be postponed.
 b. A need for increased funds will arise in the future, but no such need exists at the present time.
 c. There is a current need for increased funds, but it is not serious and can be postponed.

- d. There is no current need for increased funds, and no such need is projected for the future.
- e. There is no current need for increased funds, but such a need did arise 3 years ago.

5. According to the message, the only possible source for additional university funding is:

- a. the governor's proposed budget, which provides increased funding for education.
- b. the tax base of the state, which provides adequate funds for educational purposes.
- c. corporate revenues, which provide a major part of the state's educational funds.
- d. a tuition increase, and the matching funds an increase would generate.
- e. federal spending on education, since the federal government has mandated more money for education.

6. According to the message, which of the following is correct?

- a. There are currently no funding problems.
- b. One main budget area, faculty pay, is causing all the funding problems.
- c. There are funding problems in several budget areas.
- d. There are funding problems currently, but they are only minor.
- e. a and c.

7. According to the message:

- a. an increase in tuition is not needed at the present time, nor at any time in the near future.
- b. the prospect of increased tuition is pleasant for students, and is welcomed by a large majority of them.
- c. a 20% increase in tuition is moderate, and compares favorably with other regional universities' tuition rates.
- d. a 20% increase in tuition is not enough to solve funding problems, a larger increase is needed.
- e. an increase in tuition is only a future concern because current educational funding is very adequate.

8. According to the message, a moderate increase in tuition would:

- a. result in deficit spending, which would cause future budget problems.
- b. generate increased matching funds, which would help cover increasing costs.
- c. deplete money for equipment, which would seriously affect the quality of research done at universities.
- d. generate tax credits, which are deductible.
- e. result in large state revenues, to be pooled for social services.

COUNTERARGUING MEASURE

Please list below what you thought while receiving the message,
or immediately after.

SOURCE CREDIBILITY SCALES

Below are a series of adjective pairs. Please indicate your reactions to the communicator by placing a mark in the space that best reflects your evaluation of the person. The closer your mark is to one of the adjectives, the more you feel that word represents your attitude toward the communicator. A mark in the center scale position indicates a neutral response on that set of words.

Competent							Incompetent
Sociable							Unsociable
Unjust							Just
Active							Passive
Unselfish							Selfish
Nervous							Poised
Outgoing							Withdrawn
Honest							Dishonest
Tense							Relaxed
Qualified							Unqualified
Energetic							Tired
Cheerful							Gloomy
Lacking Confidence							Confident
Informed							Uninformed
Illogical							Logical
Cruel							Kind
Irritable							Good natured
Anxious							Calm
Unfriendly							Friendly
Silent							Talkative

ATTITUDE MEASURES

Instructions and Topic Statement

Please indicate your reactions to the following statements by placing a mark in the space that most accurately reflects your opinions of those statements. Never put more than one check mark on a single scale and be sure that each check is on the center of the position you have marked on the scale, NOT on the boundaries.

Undergraduate tuition should be raised 20% to cover the rising cost of higher education.

Semantic Differential Measure

Pleasant	:	:	:	:	:	:	Unpleasant
Strongly agree	:	:	:	:	:	:	Strongly disagree
Wise	:	:	:	:	:	:	Foolish
Worthless	:	:	:	:	:	:	Valuable
Good	:	:	:	:	:	:	Bad

Known Interval Measure

Dislike Intensely	Terrible	Very Bad	Bad	Poor	Neutral	Fair	Good	Very Good	Excellent	Like Intensely
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REFERENCE NOTE

1. Shaw, M. E. Personal conversation, May, 1978. The procedure was suggested because the multiple choice questions dealt with the central points made in arguments, while the true-false questions dealt with subpoints of the arguments (of which there were three). As such, it would be more important for receivers to comprehend the main points of the arguments presented in comparison to the supporting subpoints. Therefore, a weighting of three was suggested for the multiple choice scores in order to more accurately reflect their importance for comprehension in comparison with the true-false scores.

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BIOGRAPHICAL SKETCH

William Gill Woodall came into the world among the blue hills and green valleys of middle Tennessee, in the county of Wilson, in the town of Lebanon, on October 21, 1952. Gill grew in those hills and valleys, the seasons and sounds, in the country and in the city of Nashville, until the fourteenth year of his life. During that fourteenth year, Gill and his family moved to Winter Haven, Florida. After the obligatory years in the school system of Polk County, Gill attended the University of Florida at Gainesville, receiving a Bachelor's degree in psychology at the end of the fourth year, June, 1974. Gill continued his education at the University of Florida by entering the master's program in speech communication, and during that time, developed an ongoing interest in all aspects of nonverbal communication, as well as other communicative processes. Gill received the Master of Arts degree in speech communication in June, 1976, and continued in the program as a doctoral student. During the years in Gainesville, Gill continued pursuit of an ongoing interest of many from Nashville, music. Also during this period, another life-long interest was developed in the martial arts. In the fall of 1978, Gill completed his doctoral work and received a Ph.D. in speech communication, and accepted an assistant professor position at Cleveland State University. Gill, along with his life-partner Patricia and the family cat, now dwell in the community of Shaker Heights, and continue to continue.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



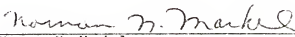
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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



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December 1978

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